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NEWS SUMMARY

NEW WAGE RATES date from April 18. *p.* 579

THE PROGRAMME for the British Architects' Conference, to be held at Harrogate in June, has been announced. p. 593

MR. E. VINCENT HARRIS has been retained by Kensington BC to prepare a scheme for a new town hall and central library to be erected on the Abbey site in Horton-street. p. 593

MOST STRUCTURAL STEELWORK to-day has not progressed far beyond the pillar and beam construction of the ancient Egyptians, Prof. Fisher Cassie told the RIBA recently. p. 594

THE GOVERNMENT IS TO WATCH how the 1954 *Town and Country Planning Act works, but considers it "too early to think of getting into the colossal trouble of amending the Act," Mr. Brooke has told Parliament. p.* 596

THE COURT OF APPEAL have held that building contractors' huts on a building site are rateable. p. 598

AT THE PRESENT HIGH RATE of costs, the house-building industry is living in a fool's paradise, and its future existence depends on its ability to build more cheaply, a contributor suggests on p. 601

EXHIBIT THE RA REJECTS

IN just under three weeks' time the one hundred and eighty-seventh exhibition of the Royal Academy of Arts will be open, and the citizens in their thousands, in warm, bright sunshine (we trust), flocking into Burlington House to view with pleasure, indifference or loathing, as the case may be, another fourteen hundred or so specimens of current British art. It is not so long since we were seeing in the daily Press photographs of the Selection Committee at work—a solemn row of seated judges peering intently at a canvas held up by an attendant for their inspection.

This annual ritual reminds us of O. Henry's story of the art-struck Western cowboy who, hearing that a distinguished artist from the East was in town, invited his opinion of a painting of a life-sized steer which he (the cowboy) had just completed. Should he, he inquired, paint some more or cut it out and ride herd a-plenty? The artist, pulling his beard and looking unhappy, observed, "For Art's sake, son, don't get in front of any more canvas. Live under it."

This advice, one imagines, must often be in the minds of those members of the Selection Committee who know their O. Henry as they decree that work after work be marked with that saddening D or X. Now several hundred canvases and drawings and other intended exhibits repose in the dark vaults of the Academy awaiting collection by their owners. Some may never be collected.

This minor tragedy, as for many it is, cannot fail to move the philosophic to sympathy and speculation. The integrity of the judges is unquestioned, but, after all, art is largely a matter of personal taste. Would other judges have selected differently? But for the chance that brought certain men of certain views together at a particular moment, would the paintings on the walls now be in the cellars and those in the cellars on the walls? Are some works of art so bad that they would inevitably be rejected by any jury, no matter how constituted? That may be so, but there must be many works on or near the dividing line whose ultimate position on one side or the other is a "close-run thing," as Wellington said of Waterloo.

Scores of drawings submitted for the Architectural Room are turned down every year, and critics of a cynical turn of mind, looking round the walls, have been known to inquire, "If these are the best what could the others have been like?" Sometimes, having seen them or some of them, before they went in, we may know, and we may have been surprised at their rejection and the acceptance of works of (as we think) inferior quality. Perhaps, after all, there may be some truth in the regularly circulated rumour that certain drawings appear on the walls only because they fit the space!

We know we are not alone in wishing that the mysteries of the Architectural Room, if such they be, could be cleared up. Of course, it can always be said that the Academy never can be a reliable mirror of the state of British architecture because there is no certainty that the best works are submitted; but at least there would be some satisfaction in knowing whether (in our own judgment) the best of those sent in have been chosen.

The only way to find out is to have an exhibition of all the rejected drawings. This suggestion has been made before, but never adopted. Could it be followed up this year? There is time. There are at least three bodies in London that could take it on—the RIBA, the AA, and the Building Centre. The last-named might perhaps be the most suitable, for it has the accommodation, organisation and enterprise to carry it through. The co-operation of the technical Press and of the architects concerned could be relied upon. If the exhibition could be arranged there would be a steady trek of architects and other interested parties between the RA and Store-street during the next few months. We commend the idea to our respected friend, the Director.

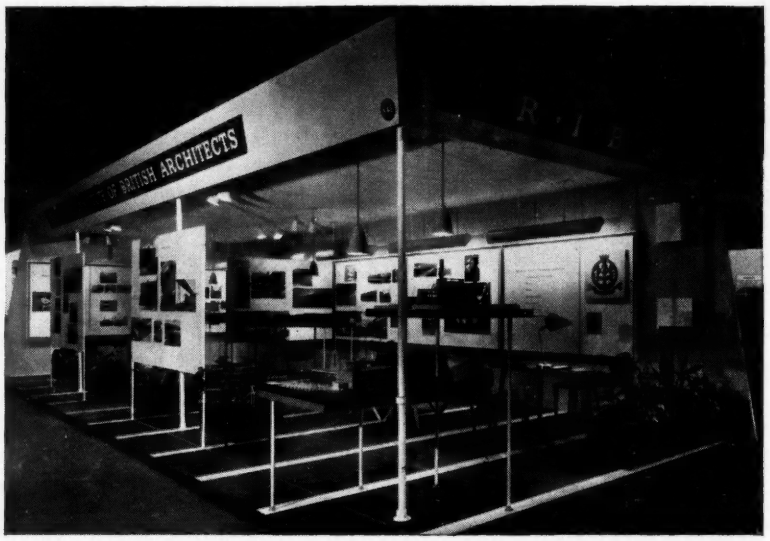
Notes of the Week

INDUSTRIAL ARCHITECTURE

THERE can be no doubt at all that the RIBA did a wise thing in taking space at the recent Factory Equipment Exhibition at Earls Court. The architect is able to provide a service which can be of enormous value to industry generally, and every opportunity should be taken to make the fact known to as many as possible of those concerned with the efficiency of the country's industrial establishments.

It was the first time that the Royal Institute had occupied a stand at this exhibition and a large number of factory owners and other visitors to Earls Court must have been impressed by the examples of the architect-designed factories illustrated. The display of photographs and models showed a variety of industrial buildings, both large and small, erected in recent years. Several of the photographs were in colour and depicted the effective use of bright colour schemes.

The stand was designed under the direction of Mr. Kenneth Bayes, FRIBA.



THE RIBA STAND at the recent Factory Equipment Exhibition at Earls Court.

INCREASING PRODUCTIVITY

THE first of a series of articles entitled "Towards Increased Productivity" appears this week on another page. In this series, the author, Mr. R. Rosner, ARIBA, proposes to discuss various Continental building techniques which have been developed during the last two decades, and which have assisted in accelerating output and lowering the cost of building, particularly in the field of multi-storey housing. The success of these techniques can only be assured if architect and builder are enabled to co-operate at an earlier time than has hitherto been customary. The author points out that the layout of a project, and the relative position of buildings, are likely to affect the efficiency of the site organisation; the number of types of dwellings incorporated in a housing scheme is bound to influence the degree of productivity obtainable by means of repetitive operations.

Rationalisation in the building industry does not necessarily imply a high degree of costly mechanisation. Much can be achieved by improving customary manual techniques and by the use of inexpensive auxiliary implements; this clearly represents a challenge to the ingenuity of our building technicians and operatives. It is also a challenge to the commonsense of everyone connected with the industry.

SOUTH BANK DEVELOPMENT. — A perspective of a projected new building to be erected on London's South Bank, for which Messrs. M. C. Hughes and Partners are the architects. The scheme is at present under consideration by the LCC. It is hoped that work on the building project, which is estimated to cost £1½m., will start next September. The architects state that there are many interesting features in the design, not the least being that subject to the approval of LCC and the Royal Fine Art Commission the building will have 28 storeys and is probably the highest office block planned for London up to date. The fastest lifts yet to be installed in England will serve the various floors, and the complete air conditioning of the building is under consideration. With the object of reducing the weight of the construction to a minimum, considerable research has been made regarding materials to be used. The building will have its own restaurants, car parking and shopping facilities.

LITTER BINS

THE NOTE in our issue of March 25 on the subject of Litter Bins did less than justice to the Ministry of Works, for the bins in Embankment Gardens to which we referred are the responsibility not of the Ministry but of the London County Council. We are sorry to have caused confusion. The reference has, however, been useful in eliciting the information that the MoW type of basket is based on the LCC example, but with the important variation that the former will include a metal inner container; this will simplify emptying and will also meet the criticism, somewhat ruefully made by an LCC park-keeper, that the Council type fails to contain the husks of that national food, the peanut.

NUFFIELD RESEARCH

THE RESEARCH initiated into the functions and design of hospitals by the Nuffield Provincial Hospitals Trust led to such useful results that in 1954 the Trustees of the Nuffield Foundation established a Division of Architectural Studies to undertake research into the function and design of buildings for an initial period of 10 years. While the constitution of the Division (under the direction of Mr. R. Llewellyn Davies, MA, ARIBA) enables it to study all types of building, the present programme covers hospitals, research laboratories and farm buildings. The Trust is now advertising a Research Fellowship, tenable for two years in London. So rare comparatively are the opportunities for pure research in architecture that the Trust's offer (details of which are in our advertisement columns) should draw an excellent response.

BUILDING CENTRE LUNCHEON

THE ANNUAL lunch given by the Building Centre is always a pleasant affair, company and food being equally excellent and speeches virtually non-existent. This year's party, held at Claridge's, was no exception; the thanks of a distinguished company of members of the building industry, presided over by Sir Giles Scott, were returned in a graceful speech from Sir Harold Emmerson, Mr. Duncan Sandys, Minister of Housing and Local Government, for once taking an easy. By the time that lunch ended, most of the problems of the building industry had been privately and amicably settled.

COMING EVENTS

THURSDAY, APRIL 14

ARCHITECTURAL ASSOCIATION.—Annual reception, 34, Bedford-square, WC1. 8.30 p.m.

SATURDAY, APRIL 16

RICS.—"Subtense Measurements," by Mr. G. Hurst, FRICS, Sheffield University. 10.30 a.m.

WAGE INCREASES

Date of Operation Fixed

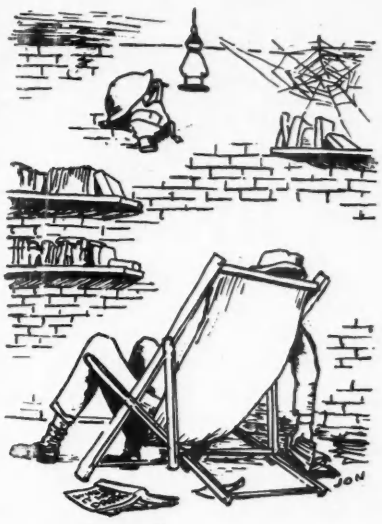
The date of operation of the Wage Increases recently decided upon by the National Joint Council for the Building Industry has been fixed for Monday, April 18.

The increases are: Craftsmen 2½d.; *Labourers* 1½d.

THE FILING ROOM

By F. R. JELLEY

I LEARN from experts in business administration that nowadays the office of every progressive architect should include a Filing Room with a register containing IN and OUT columns and a competent member of the staff in attendance to ensure that law and order are preserved. Unfortunately it is now too late for me to qualify as a progressive architect by acquiring a Filing Room or even as a resident archivist, and I fear I must remain content with the disused air-raid shelter into which I have been stuffing all my superfluous papers for the past 10 years or so. The air-raid shelter is accessible direct from my office and contains a fascinating collection of books and correspondence and old drawings. Indeed the temptation to linger there is so strong that I have installed a deck chair in which I can recline at ease and browse among these assorted relics of the years that are gone.



Here, for instance, is a Legal Hand-Book for Architects by Edward Jenkins, Esq., and John Raymond, Esq., barristers-at-law, published in 1873, and dedicated, by permission, to the RIBA. It leans heavily against a set of bound volumes of *The Strand Magazine* which are supported at the far end by a stout paper-backed copy of "When It Was Dark," by Guy Thorne, published in 1905 at a shilling.

Within easy reach also are stacks of old technical journals issued weekly, price fourpence, in those remote, romantic years when I was an apprentice with a voracious appetite for the literature of our calling.

As I turn these faded yellow pages and peer once more into the past which is part of me I notice that in December, 1904, a joyous advertiser was offering the building trade whisky at 40s. per dozen and champagne at 62s. per dozen. He adds confidently "If you drink whisky or champagne, do not fail to make yourselves acquainted with the following as soon as possible. Their merits speak for themselves."

On the other hand there were many Situations Wanted in 1904 and very few Situations Vacant, and an architect's assistant, aged 32, with 13 years' experience and articles asks for a salary of "£1 or offer."

In 1905 it is recorded that "Mr. J. Todd has passed the qualifying exam. for District Surveyor," and as I loll in my deck chair it is pleasant to recall the impressive figure of John Todd, who wore a top hat, terrified builders' foremen by his knowledge of the intricacies of the London Building Act and eventually achieved immortality by serving a Dangerous Structure Notice on the Dean of St. Paul's.

The pages of these old periodicals are enriched with lovely black and white drawings of period architecture and furniture by Walter Wills. The correspondence columns reverberate with complaints from unsuccessful participants in open competitions. The law reports are filled with the usual entertaining squabbles about light and air, dilapidations, doubtful party walls and builders who create dust. Old lead is valued at £11 3s. per ton, English rolled steel joists are quoted at £5 15s., and Cuban mahogany planks, 1 in. in thickness, are 6d. per foot super.

And at No. 9 Conduit-street, where the RIBA was still in residence, meetings of members in that beautiful old building are virile and controversial for, on December 18, 1903, I read that "there was, unfortunately, practically no discussion at the Institute on Monday night, for at the finish of Mr. Henman's paper another gentleman occupied the time until 10 o'clock and then another from Birmingham got up and moved a vote of thanks in a speech which lasted a quarter of an hour, so that discussion was blocked out. Dr. Childs was afterwards asked by the President to say something and when he commenced to condemn the 'plenum' system Mr. Henman excitedly appealed to the President to stop him. This evoked groans and other manifestations of disapproval. The next meeting promises to be a lively one." However, it occurs to me now that the primary object in visiting my air-raid shelter was to locate for my old client and schoolfellow, George, the drawings of a grandiose scheme I prepared many years ago for rebuilding one of the decrepit properties in which he is interested.

I do not think George really intends to proceed with that fantastic project, for when he spoke on the telephone he sounded far more anxious to know whether I had heard the latest Test Match scores. In any case I cannot find his scheme so I will return to the office with my copy of "When It Was Dark," and if he telephones to me again, I shall offer to lend it to him after I have myself read it once more.

After all, "When It Was Dark," described as the most daring and original book of the century, was highly recommended in a sermon preached at Westminster Abbey by a Bishop, so an architect who can produce, at will, from his Filing Room anything of that sort for the pacification of an old client need not fear criticism from experts in business administration.

CORRESPONDENCE

TRAINING FOR MANAGEMENT IN THE BUILDING INDUSTRY

To the Editor of *The Builder*

SIR,—Professor Mace's lecture [reported in *The Builder* of March 18] to the Institute of Builders on this subject deserves the closest attention from those occupying managerial positions in the building industry, and this attention will have a special value in so far as it comes from managers at the upper levels. Professor Mace approved the commencement of the development of management education by the organisation of courses for general foremen. He might well have gone on to say that the industry would be well advised to start another line of development from the top by forming "round table" discussion groups of higher executives and by sending some specially selected candidates to the Staff College at Henley. Interest in management study fostered at this level would rapidly spread downwards and, within a few years, appropriate activities might reasonably be expected to develop at all levels.

Experience has shown that encouragement of foremanship training tends to be localised by a barrier which derives from the strongly marked employer-employee division in the industry, and its influence is thereby prevented from spreading towards what Professor Mace described as training in general management. Promising young men can be persuaded to undertake a very limited range of studies at the lower end of this field but, lacking any pronounced encouragement from the top, the development of these studies and the extension of their scope will take more than a generation to achieve what might otherwise be brought about in a fifth of the time. Activity among the more senior members of the industry would not only engender a sympathy with the development of basic studies, but would also stimulate the evolution of study techniques particularly appropriate to the problems of building management. Indeed, it is doubtful whether training in general management can be effectively applied to such problems until suitable study techniques have been developed.

Apart altogether from any advantages the industry and, indeed, the whole community might derive from the effect of these developments on the efficiency of building, their influence on the development of higher technological education for the industry would be far-reaching. Higher technological education in this country at present is exclusively concerned with the training of engineers and, in so far as building is considered at all, the view seems generally to be taken that its salvation must come through some special developments in the training of certain engineers. Now engineering studies at the higher levels have certain well-defined characteristics; they follow certain well-trodden paths of applied science and their main difficulties, in the academic sense, are mathematical. It is doubtful whether an academic discipline of this type is the best that can be developed for a course of study associated with training for the building industry. The technical problems of building are very different from those of engineering; they tend to be human and

"*Easton Egg.*"

organisational rather than mathematical and purely physical and if a single academic discipline can be distilled from the stuff of management studies, that discipline is more likely to provide the right basis for higher technological studies in building than any basis at present to be found in the universities or elsewhere in this country. If this thesis is valid, then management studies are of the first importance to the future of building education and are the key to the development of the higher technological institute Professor Mace advocates.

General foremanship courses are nearly ten years old; it will soon be four years since Professor Mace told the London Master Builders' Association about Management studies in the United States; perhaps it is significant that it is now from No. 48, Bedford-square that his voice is heard for, if the development of higher building education needs a characteristic academic discipline, it needs equally the guidance and support of a properly constituted professional institution.

D. A. G. REID (BSc.(Eng.), MICE.)
Principal, Brixton School of Building.
Ferndale-road, SW4.

MAINTENANCE SURVEYORS

To the Editor of *The Builder*

SIR,—The person responsible for the varied types of properties now owned by local authorities is called on to perform such a wide variety of duties that a generally recognised designation is long overdue. These duties very briefly are:

Preparation of estimates and specifications;

Supervision of contracts;

Ordering and supervision of small works and checking accounts; and

Diagnosing the cause and prescribing the cure for the many problems that arise in connection with buildings, particularly with regard to multi-storey blocks of flats and new methods of construction.

The qualifications necessary to carry out these duties are, I would suggest, a wide practical experience allied to an intimate knowledge of building construction and materials, plus the necessary technical training to supply the theoretical background.

The designation which would appear to embrace these duties and at the same time define their limits, is, I suggest, either Building Surveyor (Maintenance) or Building Maintenance Surveyor.

C. H. TURNER [MICW].
50, Cumberland-street, SW1.

STEEL SCAFFOLDING

To the Editor of *The Builder*

SIR,—When I read Mr. C. L. Laing's letter in your issue of March 25 I thought he had put his finger on the weakness of my suggestion (March 16) that it would be to the advantage of a builder to own, rather than to hire, steel scaffolding sufficient at any rate for the smaller jobs. Mr. Laing points to the safety factor—obviously an essential consideration—and thinks that "a scaffolding manufacturer with a first-class reputation . . . would prefer to be responsible for his own work."

I accepted this as a sound reason why ownership of scaffolding by builders had not been either popular or encouraged, until I looked through the advertisement pages of the same issue and found a very well-known scaffolding manufacturer, of unquestionably "first-class reputation," deliberately offering scaffolding for sale on the grounds that the small builder could save money by having his own. Presumably this manufacturer has no fear that the safety factor will suffer by having the scaffolding erected by others than his own skilled men, and he would not be likely to endanger his reputation by risking an accident.

Mr. Laing's other arguments seem to apply more to the big jobs (for which I never doubted the advantages of hiring) rather than to the small ones I had in mind.

C. H. KITCHIN.
Hawthorndene, Strawberry Vale, N2.

HANGING A DOOR

To the Editor of *The Builder*

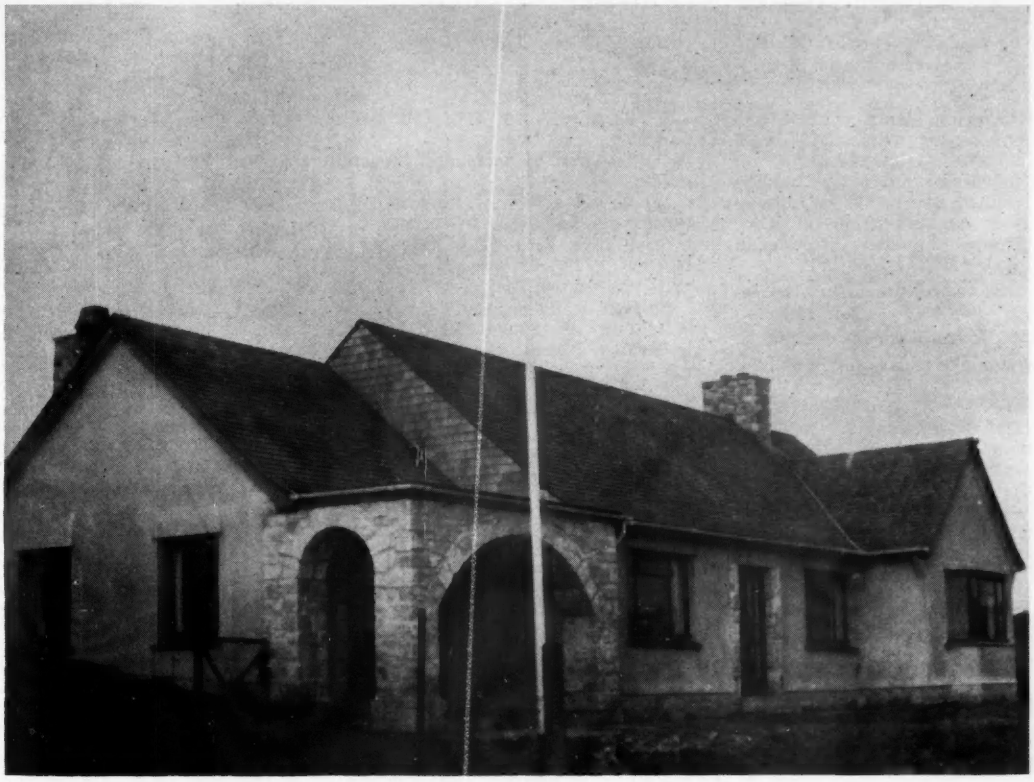
SIR,—I have been a regular reader of your book for some considerable time, finding the contents very interesting and instructive.

The reason for writing is to recall that whilst serving my apprenticeship as carpenter and joiner, I was given the job of hanging a framed, ledged and braced matchboard door. I had made what I thought was a first-class job, when along came the boss to inspect it; he picked up a carpenter's stool and, placing it in front of the door, said: "Now sit there until you find out what you have done wrong, and then put it right in your own time." Eventually I found I had hung it on the wrong side.

This incident happened over 30 years ago, but it came back fresh in my mind seeing the same thing in your issue of March 25 (p. 502, Herstmonceaux School, before reconditioning).

If this door was not hung as a temporary measure, the same treatment might do the carpenter responsible some good!

A. TURNER.
2, Station-road, Burnt Mill,
Harlow, Essex.



BUNGALOW AT PORTMELLON, MEVAGISSEY, CORNWALL

Architect
VYVYAN SALISBURY, FRIBA

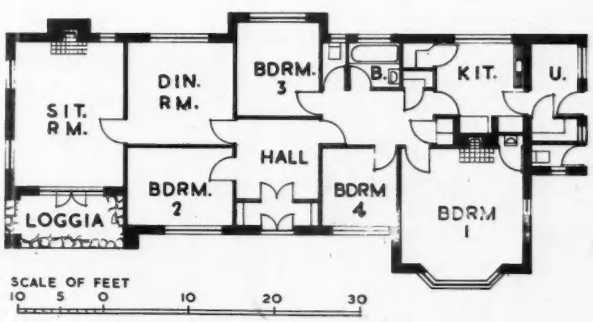
Builders
J. WILLIAM & CO.

THIS bungalow overlooks Portmellon, having wonderful coastal views. In order to reduce hall and passage space to the minimum, access to the sitting-room is through the dining-room. Hot water is provided by an Aga model CB.

Construction.—All walls are of concrete block. External walls have a cavity and are rendered in cement and finished with silver grey Cullamix Tyrolean finish. Loggia and chimneys are of granite setts. The roof is covered with Colt's cedar shingles. Windows are galvanised iron with sub-frames.

Finishes.—All floors, except the kitchen, have been finished in beech wood block, the kitchen floor being red quarry. All walls throughout the bungalow are distempered ivory, and the woodwork enamelled to match.

Built during 1951-52, the approximate cost was £3,192, the total floor area being 1,499 ft. super.



Plan of the bungalow.

TOWARDS HIGHER PRODUCTIVITY

1—*The Rationalisation of Housing Site Operations*

By R. ROSNER, ARIBA, AMTPI

THE rationalisation of domestic construction has so far remained a much neglected subject. For that reason recent investigations carried out by the Building Research Institute Bauen und Wohnen in Stuttgart are of considerable interest. They may be grouped under three main headings:

(1) The analysis of site operations on existing sites.

(2) The rationalisation of site operations.

(3) The training of managerial personnel.

(1) *ANALYSIS OF SITE OPERATIONS*

(i) Time and motion studies.

(ii) Observations of body movements: sitting, standing, walking, stooping, posture necessitated by the type of work.

(iii) Motion studies: repetition, rhythm, use of hands and legs.

(iv) Analysis of operational phases: team work, mutual obstruction within teams, time studies of single motions.

(v) Supply of materials: horizontal and vertical transport; length and condition of roads and transport lanes; means of transport.

(vi) Organisation of teams: supply of materials, controls, reports, accounting.

(vii) Division of work into minor phases (Figs. 1 & 2).

(viii) Time studies of minor phases: (*a*) Constant analysis by means of reports and progress charts; (*b*) intermittent analysis by means of time studies (Fig. 3).

(ix) The use of standard times for: (*a*) the determination of labour requirements and dates of completion, and (*b*) costing.

The transport of floor units, lintols, bricks, concrete blocks, reinforcing rods and concrete are stop-watched on the basis of an operational cycle. The following example gives the cycle for the transport of bricks:

(*a*) Loading of barrow from stack (number of bricks).

(*b*) Transport by barrow (distance in feet).

(*c*) Barrow into hoist (number of barrows).

(*d*) Hoist-up (distance in feet).

Fig. 1.—Right and wrong methods of carrying heavy units, showing how the use of a simple labour-saving device can avoid needless muscular strain.

(*e*) Barrow out of hoist (number of barrows).

(*f*) Transport within building(distance in feet).

(*g*) Return with empty barrow (distance in feet).

(*h*) Barrow into hoist (number of barrows).

(*i*) Hoist-down (height in feet).

(*j*) Barrow out of hoist.

(*k*) Empty barrow to stack (distance in feet).

(2) *RATIONALISATION OF SITE OPERATIONS*

(i) *Selection of economic plant.* The inter-relation of various types of equipment is known, but its precise influence on productivity is not yet sufficiently appreciated.

The field tests carried out by the Stuttgart Institute Bauen und Wohnen are therefore most timely.

A large site with eight identical blocks of flats (A-H) was chosen. The blocks had an overall area of 12.05m. × 41.09m. each, and were four storeys high (exclusive of basement). The Institute proposed to establish: (1) the relative influence of various types of plant on production, and (2) principles for efficient site organisation.

Fig. 3.—Making a time-study with the aid of a stopwatch: the recording of time studies and their analyses are outlined in Charts A, B and C.

Four different means of transport were analysed:

Blocks A-C	Tower crane
Blocks D-F	Trucks on rails and hoists
Block G	Cargo trucks and hoists
Block H	Wheel barrows and hoists

Fig. 2.—Another example of the avoidance of needless strain, in this case by the use of a labour-saving device for the laying of filler blocks.

TIME STUDY (CHART A)

Town:	Site:
Day:	Progress Engineer:
Type of work:	Laying of blocks with trowel.
Tools:	Trowel, hammer, spade, rule, level, pump, water bucket, 100L mortar container.
Location:	Distance between mortar containers, 1.9m.; distance between mortar containers and wall, 0.6m.
Materials:	Pumice-concrete blocks 18 kg. 49/25/22 cm. Lime mortar 1 : 3.
Task:	Straight wall with quoin and window opening.
Quantity:	40 m^3 of wall at ground floor level built by three bricklayers.
Weather:	Sunny, moderate breeze, min. + 10 deg. C. max. + 19 deg. C.
Other Factors:	None.

Worker:

No.	Name	Trade	Age	Grade of ability (per cent.)
1	X	Bricklayer	36	110
2	Y			
3	Z			

TIME STUDY (CHART B)

Type of Work Quantities and distances	Running times (minutes)	Single times 1/100 min.	No.	No. for operational phase
Start: 07 hrs. 10 min.				
Walk to place of work 30m.	10.18			
Getting ready of tools	10.80	62	1	90
Softening of mortar (80 litres)	11.64	84	2	91
Tightening of string (8m)	16.32	468	3	51
Laying of corner block	17.41	109	4	61
Laying of stretcher block	19.03	162	5	01
Laying of stretcher block	20.35	132	6	02
Laying of stretcher block	22.54	219	7	02
Laying of stretcher block	23.78	124	8	02
Laying of stretcher block	25.05	127	9	02
Stop: hrs. min.				

TIME STUDY (CHART C)
ASSESSMENT OF CHART A

Operational phase	No.	01		02		02			
	Description	Placing of corner block		Placing of stretcher block		Placing of stretcher block		Etc.	
		No.	Time	No.	Time	No.	Time	No.	
Times in 1/100 minutes		5	162	6	132	—	—		
		14	143	7	219	—	—		
		19	243	8	124	88	180		
		21	151	9	127	91	146		
		44	222	15	130	—	—		
		51	141	16	221	—	—		
		—	—	17	140	—	—		
		—	—	18	133	—	—		
		—	—	—	—	—	—		
		—	—	—	—	—	—		
Sum 1/100 minutes			1,153				4,768		
Quantity			6 blocks				34 blocks		
Average output			1.93 min./block				1.40 min./block		

Time for breaks must be added to the average output times.

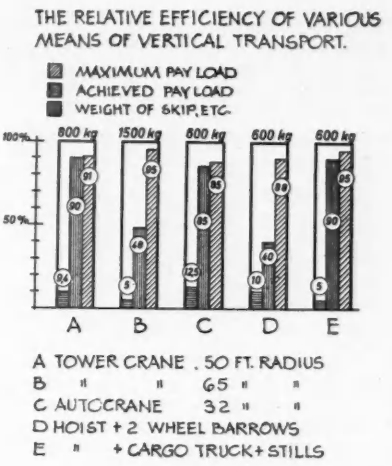


Fig. 7.

Cost analyses and time studies not only established the ratios for wages, equipment, depreciation, interest payments, rent and power, but also gave an indication of the most suitable methods of transport. The relative efficiency reached during the erection of the various blocks is demonstrated in Fig. 4. Block G, it should be noted, was built with the aid of a project plan.

The cost of pre-planning amounted to DM200, a small fraction of the overall cost reduction achieved.

(ii) *Card index for equipment.* An index of all machines and other plant in use should be kept. A card for each unit provides data on make, performance, dimensions and location. This facilitates an efficient combination of various types of equipment.

Much care must be taken to synchronise the various means of production, e.g., it would be costly to use a 500-litre concrete mixer and a tower crane with a capacity of 800 kg. The weight of the skip is 250 kg.; this leaves a pay load of 550 kg. =250 litres of concrete. As the operational cycle of a crane is of longer duration than that of a mixer, a 250-litre concrete mixer will be more suitable in this particular instance. The data of machines and equipment for a given site are entered on a plant index (Fig. 5).

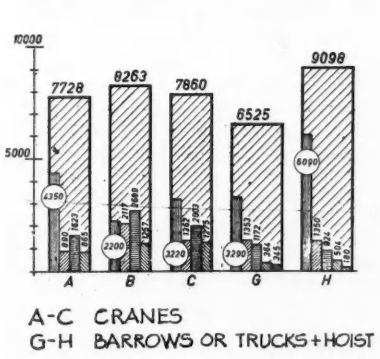


Fig. 4.

PLANT	DATE	No. OFF	MAKE & TYPE	PERFORMANCE	OVERALL DIMENSIONS
CONCRETE MIXER					
MORTAR MIXER					
TOWER CRANE					
WINCH					

Fig. 5.—*Plant index.*

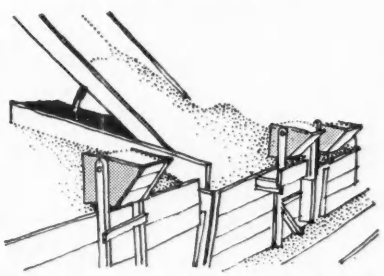


Fig. 6.—*A lorry tips ballast into an enclosed dump. The dumps are placed to fall in order to facilitate carting away; each dump is equipped with a measuring box.*

(iii) *Concrete mixing plant.* The type of plant is determined by (1) the required quantities; (2) the required mixes; and (3) the available equipment.

Generally, coarse aggregates and sand are dumped by lorries near the mixer and then shovelled by hand into the hopper. Unless delivery and output are synchronised, shortages or excessive accumulation of materials are likely to ensue. In the latter case, materials will have to be stored at increasing distance from the mixer, thus requiring secondary transport (barrows, trucks or belt conveyors).

(iv) *Mixes of varying proportions.* The Stuttgart Institute recommends the use of enclosed dumps; their number is dependent on the variety of aggregates to be used. Attached to these dumps are measuring boxes. The dumps should preferably be grouped on falling ground in order to facilitate manual transport towards the mixer (Fig. 6). Measuring boxes with automatic locking devices have proved an inexpensive and useful innovation.

(v) *Submerged and Elevated Silos.* Silos are used for large quantities of concrete, Lorries dump the materials into a submerged silo whence they are transported by belt conveyors or cranes to elevated silos which service the mixers.

Managerial personnel hold divergent views about the economy of various storage methods and their relation to the quantity of concrete to be produced. Site surveys and estimating should therefore precede the choice of a certain method of storage.

(vi) *Means of transport.* The Institute attaches much importance to the efficiency of transport methods because wages for site transport and the servicing of equipment may amount to as much as 25 per cent. of the total wage bill for the superstructure.

(vii) *Cranes and hoists.* Overhead and tower cranes or small and large mechanical hoists are the means of vertical transport. During the last 30 years overhead travelling cranes have been used in various Continental countries. They are most suitable for prefabricated structures and

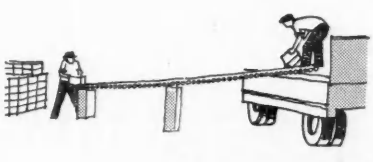


FIG. 8.

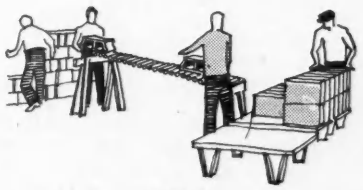


FIG. 9.

Fig. 8.—*Roller conveyor used for transport of blocks from lorry to stack.* *Fig.* 9.—*Roller conveyor used for transport of blocks from stack to stills.*

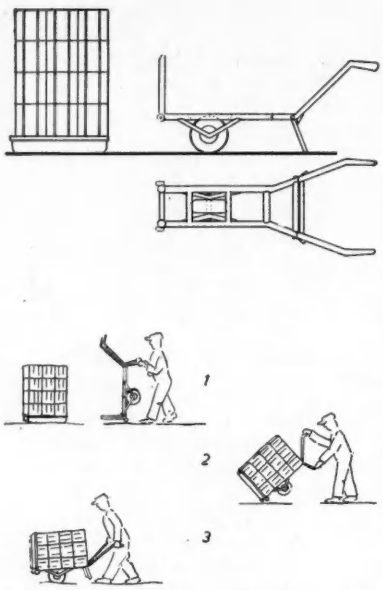


Fig. 10.—*The transport of brick parcels.*

site layouts incorporating parallel blocks, but they are less mobile than tower cranes. Cranes generally are indispensable for hoisting heavy and bulky loads, e.g., precast concrete units for walls and floors. When large quantities of small units, e.g., bricks and concrete blocks, are required, the combination of mechanical hoist and cargo truck is more effective.

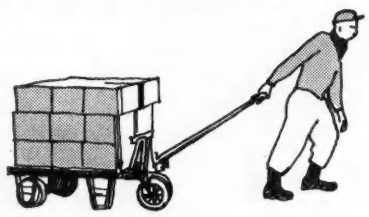


FIG. 11.

Fig. 11.—*The loaded still is removed by cargo truck. Fig.* 12.—*The cargo truck is moved across the loading platform to the hoist.*

The efficiency of a lifting device depends on its utilisation to maximum capacity. Fig. 7 illustrates the value of various means of vertical transport.

(viii) *Roller conveyors.* Roller conveyors are an established method of transport in numerous industries; recently they have also been successfully tried out in the German building industry. Each conveyor consists of numerous rollers running on ball bearings; a fall of only 2 to 4 per cent. ensures the most economical transport of bricks and light-weight concrete blocks (Figs. 8 and 9).

(ix) *Wheel barrows.* The capacity of wheel barrows used for the transport of coarse aggregates, sand mortar and concrete must be synchronised with the capacity of mixers, e.g., two barrows with a capacity of 175 litres each can be used most economically with a 375-litre mixer. The cartage of bricks and light-weight concrete blocks by ordinary wheel barrows is being gradually abandoned because the advantages of special trucks and barrows are now fully recognised (Fig. 10).

(x) *The Cargo truck.* The cargo truck is an established means of transport in numerous industries: it is capable of carrying loads of up to 1,100 kg. The rubber-tyred truck is run under a still; a foot-operated frame attached to the truck then lifts the still off the ground. The stills may be loaded directly from material stacks or with the aid of roller conveyors from incoming lorries (Fig. 8).

The transport lane for this type of cargo truck must be of an adequate thickness (see xiii). Its width and length depend on the size of the building to be erected, i.e., 8 ft. 4 in. by 30 ft. to 60 ft. This makes it possible to operate with 10 to 20 stills whilst leaving adequate space for transport. Tests have shown that one worker can operate more easily a cargo truck carrying 24 perforated blocks than a wheel barrow carrying four such blocks. Repeated unloading is eliminated and wages required for the operations involved may be reduced by as much as 75 per cent. (Figs. 11 and 12).

(xi) *Transport roads and lanes.* Roads serve heavy vehicular traffic, lanes serve the traffic between material dumps and stacks and the building.

(xii) *Roads.* In favourable circumstances, existing roads may be used. Where virgin sites are developed, the whole road system including services should be constructed first. Where roads are not available in the proximity of a site,

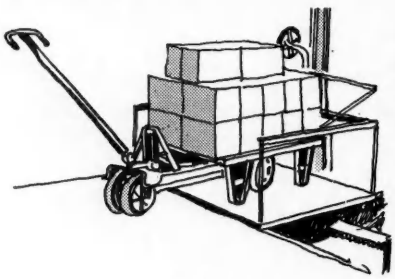


FIG. 12.

lanes consisting of sleepers or hardcore should be laid. In the case of light, sandy soil, two strips of interconnected mild steel plates are more suitable.

(xiii) *Lanes.* The importance of adequate transport lanes is rarely recognised. In the case of the cargo trucks, satisfactory results have been achieved by the construction of concrete lanes 3½ in. thick, and with an overall area of 8 ft. 4 in. by 60 ft.

(xiv) *Accommodation for personnel.* The Institute recommends fully equipped mobile units for managerial staff and operatives. Where canteens with adjoining cooking facilities are provided, the writer would add that more attention should be given to kitchen equipment. Chipped stoneware instead of metal sinks, inadequate supply of hot water, the use of swabs instead of nylon brushes for washing-up, and the lack of drying racks for dishes increase the danger of disease.

(xv) *Project planning.* Efficient site organisation encourages the operatives to increase output and losses of materials, fittings and equipment tend to decline.

(xvi) *Planning at managerial level.* The site agent or his deputy should participate in project planning at an early stage.

(xvii) *Site survey.* No project plan can be drawn up without exact knowledge of local conditions. The required site survey should deal with the following questions:

TRANSPORT: To what extent can the nearest public road be used? What is its condition? Is it necessary to use it partially for material dumps? Will it have to be closed at any point? Approach from public road to the building? Is reinforcement necessary? Turning space for vehicles?

SITE CONDITIONS: Contours? Geological peculiarities? Water table?

MATERIAL	HEIGHT OF STACK	No. PER SQUARE YARD	APPROX. DAILY REQUIREMENT No. OFF	NECESSARY RESERVES No. OFF	SPACE FOR RESERVE STOCK IN SQ. YD.
	1	2	3	4	5
BRICKS	6' 10"	756			
10" HOLLOW BLOCKS	6' 10"	756			
	QUANTITY	AREA			
	CU. YARDS	SQ. YARDS	CU. YARDS	CU. YARDS	SQ. YARDS
DUMP FOR AGGREGATES	4'0	12'0			
" " "	6'5	15'6			

Fig. 13.—*Space requirement index.*

WATER SUPPLY: Connection available? Where? Volume of water available? Distance from building? Head of water?

POWER SUPPLY AND TELEPHONE CONNECTIONS: As water supply.

Upon the completion of the site survey and the boring of trial holes, progress charts are drawn up, to be followed by a time-table for the delivery, storage and use of various materials. The time-table is based on working drawings, bills of quantities and progress charts.

(xviii) *Disposition of equipment.* Once the most economical equipment has been chosen, its effective location has to be determined. Efficiency depends on the length of the transport lanes. Three separate plans for excavations, superstructure and the finishing trades must be prepared.

The investigation covers the use of various types of equipment:

(1) Tower crane.

(2) Trucks on rails and large mechanical hoists. (The writer has omitted details as they are generally not applicable to our housing sites.)

(3) Mechanical hoists and cargo trucks.

(4) Mechanical hoists and wheel barrows.

As a result the Institute has developed "model project plans" for sites using the

Fig. 14.—*Preliminary project study with the aid of models.*

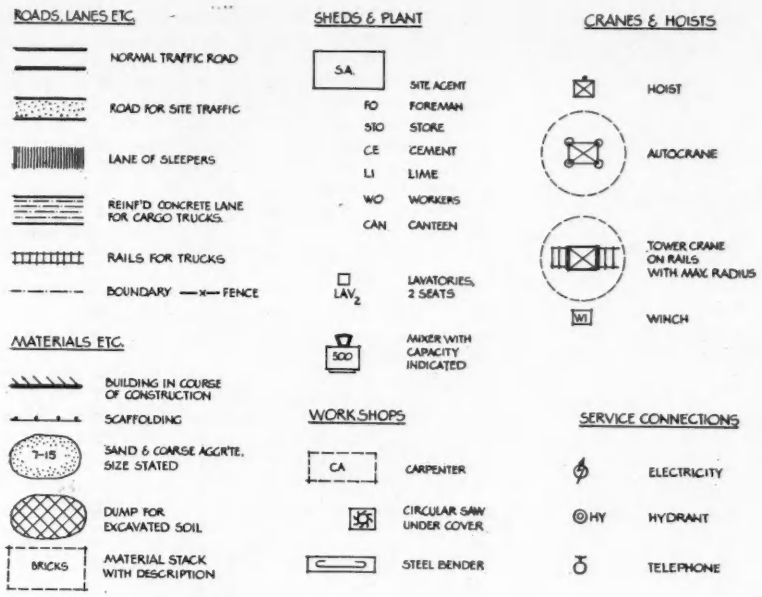


Fig. 15.—Symbols for project plans.

above equipment. A few points are worth noting:

(*a*) Hoists should be placed centrally against a building wherever access through windows or balcony openings is possible.

(*b*) The concrete mixing plant and the material stacks should be kept separate.

(*c*) The mixer should empty directly into barrows or other containers placed on the platform of the hoist. In some cases the installation of a chute may be necessary.

(*d*) All roads used for supplying the site should be arranged as thoroughfares and not as culs-de-sac. Lay-bys should be arranged at intervals.

(xix) *The assessment of project plans.* Time study checks of transport costs which establish the relative efficiency of project plans have been used by the Institute for the preparation of charts which facilitate the qualitative assessment of a given site lay-out; this applies particularly to the relative location of equipment (Fig. 19).

Digits for minus points are printed below the diagonal division lines. These digits range from 2 to 10. Relative values are indicated by the placing of a digit ranging from 0 to the possible maximum above the division line, e.g., 0/2 to 2/2.

(xx) *Space requirements.* Space requirements for various building materials should be considered in advance, because the storage of excessive quantities will cause disorganisation. If possible, deliveries should conform to material plans. The volume of reserve stacks or material dumps should be equal to estimated daily requirements multiplied by the number of days during which no deliveries are likely to take place. The space requirement index lays down the areas for various materials (Fig. 13). Areas for reserve stacks are permutated by the division of figures in column 4 by figures in column 2. The quotients are entered in column 5. The sum total of column 5 should not be equal to maximum space requirements at a given time because various materials will not be required simultaneously. The space requirement index must therefore be supplemented by a time table for deliveries. Areas for sheds, hoists, mixers, are found in the plant index. (Fig. 5).

The use of ¼ in. scale models in sand boxes is indispensable for the preparation of project plans (Fig. 14). A set of models should include scaffolding hoists, tower cranes, sleepers, logs, scantlings, brick stacks and sheds. Foremen and operatives much appreciate this kind of preliminary planning. Fig. 15 outlines a range of symbols suitable for project plans.

(xxi) *Model project plans: Development, use and adaptation.* The model project plans outlined below result from comparative investigations of the eight identical blocks of flats A-H. The adaptation of these plans to the conditions of existing sites in various parts of Western Germany has been successful. In reconstruction areas the sites were usually more congested and the closing of roads was not possible. On virgin sites the deposition of excavations and top soil was often handled in a haphazard manner (Fig. 16, 17 & 18).

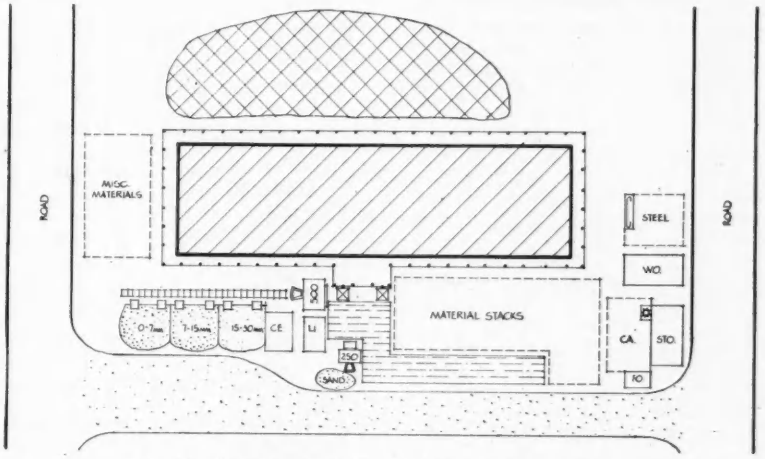


Fig. 16.—Model project plan for hoists and cargo trucks.

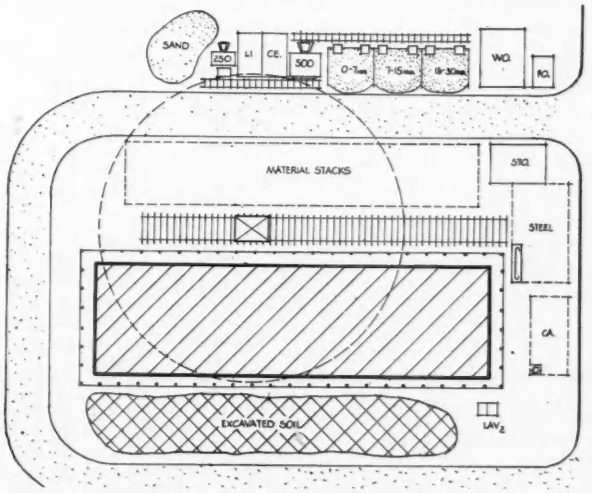


Fig. 17.—Model project plan for a tower crane.

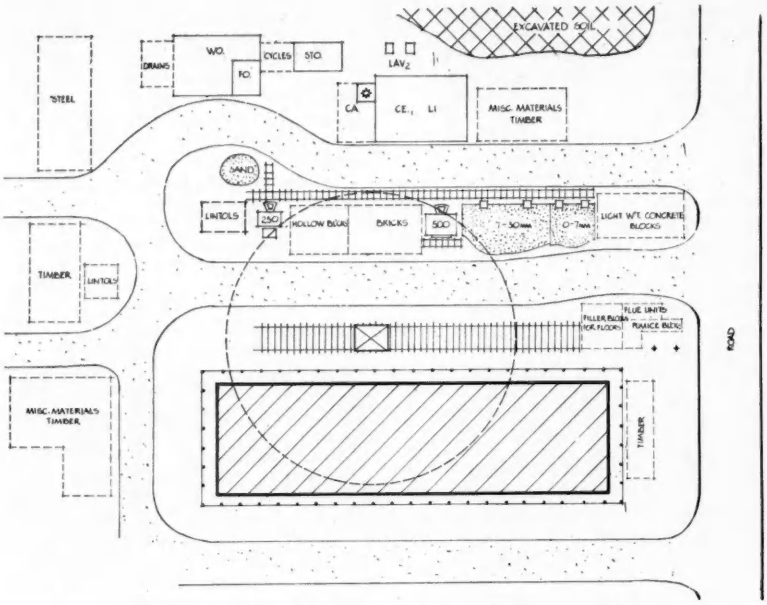


Fig. 18.—Inadequately planned site with tower crane.

MODEL PLAN FOR TOWER CRANES (Fig. 17). The concrete plant and the storage of materials have been placed along either side of the 15 ft. road. The concrete plant lies on the perimeter of the tower crane's area, and therefore does not occupy valuable storage space.

(xxii) *Critical analysis and improvement of an existing building site equipped with a tower crane* (Figs. 17 and 18; also site efficiency index, Fig. 19). The site has been organised on the basis of a project plan and appears to be orderly.

Because of poor soil conditions the crane had to be positioned at some distance from the building which therefore could not be fully serviced (5 minus points in column 1, site efficiency index, Fig. 19). The mixer lies on the main axis of the building and the crane has to move the shortest possible distances along the rail (0 minus points in column 5). The crane carries a maximum load of 800 kg. at maximum radius, but manages to move a maximum load of 550 kg. per operational cycle, i.e., 250 litres; the capacity of the mixer is 500 litres (4 minus points for plant assessment, column 5).

The preparation of mortar is badly organised. Whilst sand has been dumped close to the mixer (0 points in column 6), the shed for the storage of lime is too far away (5 points in column 7). The model plan outlines a better arrangement.

COLUMN	RELATION TO: / ITEM, EQUIPMENT:	1 MEASURING BOXES	2 CONCRETE MIX.	3 MORTAR MIX.	4 HOISTING OF CONC.	5 HOISTING OF MORTAR	6 BRICK STACKS	7 STACKS FOR BEAMS	8 TIMBER STACKS	9 TRANSPORT LANE	10 WORKERS' ACC'TION	11 GENERAL STORES	12 LAVATORIES	13 CARPENTERS' SHOP	14 STEEL BENDERS' "	15 CASTING OF LINTOLS	16 ACCESS TO BUILDING	17 MISC. MATERIALS	18 WINCHES	19 ASSESSMENT OF ITEM
1	BUILDING	–	–	–	5/10	5/10	–	–	–	–	–	–	–	–	–	–	3/	–	–	–
2	AGGREGATES	0/5	0/8	–	–	–	–	–	–	0/8	–	–	–	–	–	–	–	–	–	0/10
3	MEASURING BOXES		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2/5
4	STORES FOR CEMENT		0/6	3/3	–	–	–	–	–	0/6	–	–	–	–	–	–	–	–	–	1/3
5	CONCRETE MIXER			–	0/8	–	–	–	–	–	–	–	–	–	–	2/4	–	–	–	4/5
6	SAND			0/8	–	–	–	–	–	0/8	–	–	–	–	–	–	–	–	–	–/–
7	STORES FOR LIME			5/6	–	–	–	–	–	0/6	–	–	–	–	–	–	–	–	–	1/3
8	MORTAR MIXER				2/5	–/5	–	–	–	–	–	–	–	–	–	–	–	–	–	1/3
9	HOISTING OF CONCRETE				0/2	0/5	–	–	–	–	–	–	–	–	–	–	–	–	0/6	0/10
10	HOISTING " MATERIALS					4/10	0/7	3/6	–	–	–	–	–	–	–	–	–	–	0/2	0/10
11	BRICK STACKS						–	–	0/10	–	–	–	–	–	–	–	–	–	–	4/10
12	STACKS FOR BEAMS							–	0/7	–	–	–	–	–	–	–	–	–	–	0/3
13	TIMBER STACKS								0/6	–	–	–	–	–	–	–	–	–	–	1/3
14	TRANSPORT LANE									–	1/6	–	–	0/7	–	–	0/6	–	–	6/10
15	FOREMAN'S OFFICE									0/2	–	–	–	–	–	1/1	–	–	–	0/2
16	WORKERS' ACC'TION										–	0/2	–	–	–	2/3	–	–	–	0/5
17	GENERAL STORES											–	0/2	–	–	2/2	–	–	–	2/5
18	LAVATORIES												–	–	–	2/3	–	–	–	0/2
19	CARPENTERS' SHOP													–	–	2/3	–	–	–	1/5
20	STEEL BENDERS' "														–	1/3	–	–	–	0/3
21	CASTING OF LINTOLS															–	–	–	–	1/2
22	ACCESS TO BUILDING																–	–	–	0/3
23	MISC. MATERIALS																	–	–	2/5
24	WINCHES																		–	0/3

ASSESSMENT OF RELATIVE POSITIONS OF PLANT: 40 MINUS POINTS

ASSESSMENT OF PLANT, ETC. : 26 MINUS POINTS

TOTAL : 66 MINUS POINTS

Fig. 19.—Site efficiency index for layout shown in Fig. 18.

The brick and block stacks are within reach of the crane but cannot be loaded directly on to the skips (4 minus points in column 10). The stacks are better arranged along the rails close to the building. Two drives from the main road are unnecessary (6 minus points in column 14). The drive should lie between stacks and the mixing plant.

The casting of lintols is carried out in two separate places, i.e., at some distance from the concrete mixer (2 minus points in column 5).

(3) *THE TRAINING OF MANAGERIAL PERSONNEL*

The efficient supervision of any site is impossible without adequately trained site agents and foremen. The Institute arranges regular training courses for managerial personnel. The curriculum includes the following subjects:

(1) Preliminary interview with submission of testimonials to ascertain training, experience, social background and future aims.

(2) Written examination to test degree of intelligence, ability to express thoughts and to plan in advance and technical knowledge.

(3) Examination to test practical knowledge, manual skill and alertness.

(4) Informal interview to test qualities of leadership, sociability and sense of fairness.

(5) Discussion of examination results to encourage self-criticism.

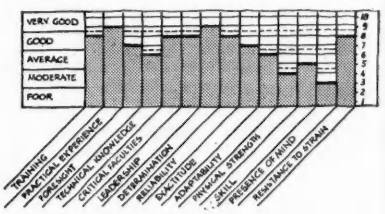


Fig. 20.—The training of managerial personnel: ability quotients for prospective foremen. Indices with different quotients may be used for skilled, semi-skilled and unskilled manual workers.

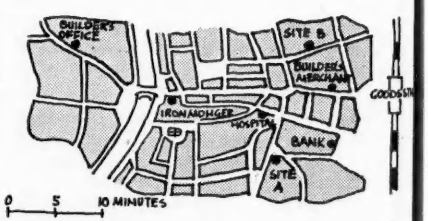


Fig. 21.—The training of managerial personnel: typical example of written examination. Various tasks are to be carried out within the shortest possible time with the aid of a given map.

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(*To be continued*)

Front elevation to appliance room.

FIRE BRIGADE STATION AT GRAYS, ESSEX

Architect to Essex County Council
H. CONOLLY, FRIBA

Deputy County Architect
D. SENIOR, FRIBA

Assistant County Architect
K. D. BOX, ARIBA

Sectional Architect
S. C. GUNNING, LRIBA

Quantity Surveyors
E. C. HARRIS & PARTNERS

Heating & Electrical Engineer
G. R. HEDINGHAM, AMIH & VE

Clerk of Works
A. L. AGER

Builders: WILLIAM BLOOD, Ltd.

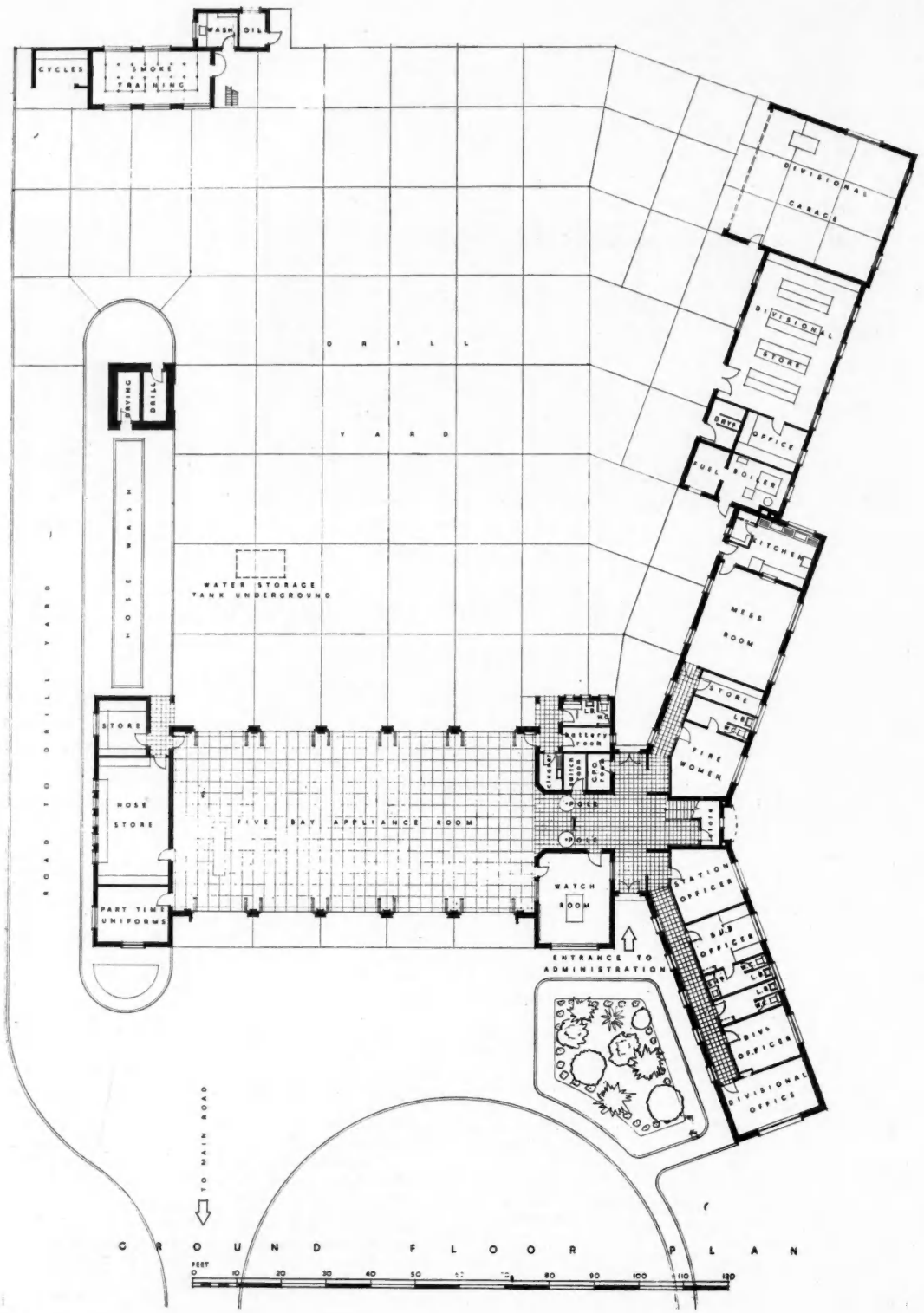
THIS new fire station and ancillary buildings are strategically placed on high ground which overlooks both the town of Grays and the north bank of the River Thames. It will serve as the divisional headquarters for this part of Essex, and provides fire cover for the large new LCC Aveley Housing Estate, which is near by. The station provides an appliance room for five vehicles, and garages for three divisional vehicles. In addition, there are administrative offices, rooms for sleeping and recreation, and stores, and there is a detached drill tower as well as a special smoke chamber. On the site are two detached houses for officers. Eight houses for firemen have been built on a neighbouring site.

The fire station has been built on a site measuring 400 ft. by 200 ft. The main structure has been placed well back on the site to avoid a large quarry excavation. The latter has been filled in with large boulders and surplus earth, and it is now used as a soakaway for surface water drains.

The station is planned on the principle of the administrative activities being concentrated at one end of the appliance room, in this case in a two-storey wing. A large central hall, with pole drops and staircase, serves to absorb any sudden concentration of personnel during alarm calls. The hall can also be used as a muster bay. All rooms in the two-storey administrative wing have a southerly aspect. A single-storey wing at the back of the station with access from the drill yard houses the boilers, the divisional stores and garages. At the north end of the appliance room are the various store rooms, including hose store, closely linked with the hose wash and hose drying tower.

The 60-ft. high hose drying and drill tower is surmounted at the top by a glazed look-out from which may be obtained an uninterrupted view of the surrounding district. The smoke chamber is of two storeys and has been designed to meet the special needs for training firemen to deal with fires on board ship. The two smoke chambers, one on each floor, are connected vertically by a trap door and iron ladder. Access to the first-floor smoke chamber is obtained by an outside staircase and balcony.

The buildings generally are constructed with brick bearing walls and concrete floors and roofs. The roof over the appliance room, however, is supported on aluminium trusses of a flat pitch and covered with Stramit boards and roofing felt. The walls of the appliance room are finished with facing bricks and the floor with grooved buff quarry tiles. The central hall and corridors on the ground and first floors have buff quarry tiled floors. Elsewhere floors are mainly


WASH
OIL
CYCLES
SMOKE TRAINING
DRILL YARD
DRYING
DRILL
HOSE WASH
ROAD TO DRILL YARD
WATER STORAGE TANK UNDERGROUND
DIVISIONAL GARAGE
DIVISIONAL STORE
OFFICE
FUEL
BOILER
KITCHEN
MESS ROOM
STORE
LOCKERS
FIRE WOMEN
STORE
HOSE STORE
PART TIME UNIFORMS
FIVE BAY APPLIANCE ROOM
BATTERY ROOM
CHARGING
SERVICE
CYCLES
POLES
WATCH ROOM
STATION OFFICER
SUB OFFICER
LOCKERS
DIVL OFFICER
DIVISIONAL OFFICE
ENTRANCE TO ADMINISTRATION
TO MAIN ROAD
GROUND FLOOR PLAN
FEET
0 10 20 30 40 50 60 70 80 90 100 110 120

of composition tiles. The building is centrally heated throughout. There is special provision for heating the appliance room by Rayrads fixed flush with the ceiling.

Following is a list of sub-contractors and suppliers:

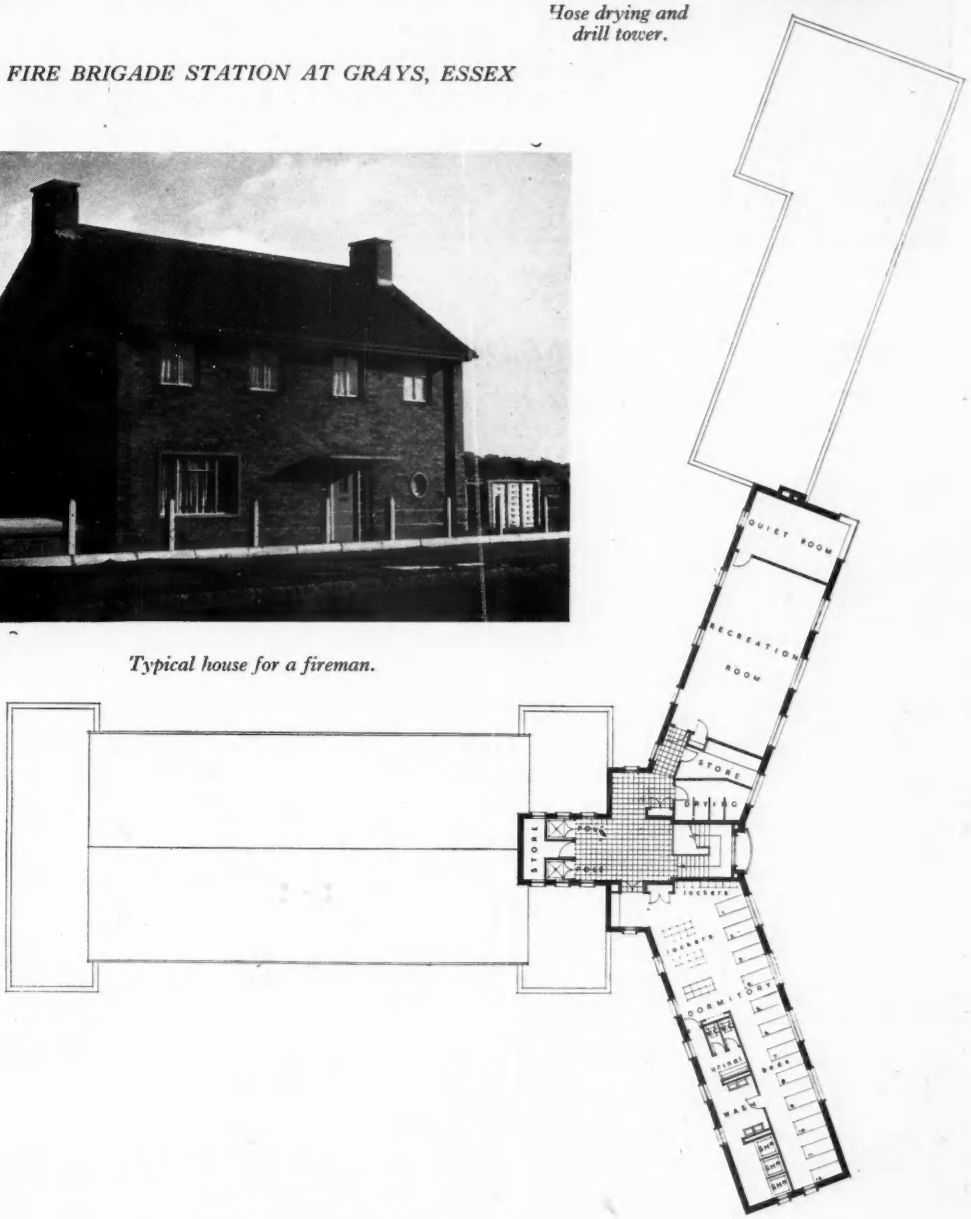
Sub-contractors: Prestressed suspended floors and roofs, Costain Concrete Co., Ltd.; aluminium trusses, F. C. Payter and Co., Ltd.; heating and hot water, Coleman and Hosking; electrical services, Tucker Bros. Electrical Engineers (Essex), Ltd.; suspended ceilings, The Tentest Fibre Board Co., Ltd.; felt roofs, D. Anderson and Sons, Ltd.; Accotile flooring, Rowan and Boden, Ltd.; parquet floors, Onsite Flooring Co.; terrazzo, Art Pavements and Decorations, Ltd.; quarry tile floors, W. B. Simpsons, Ltd.

Suppliers: Facing bricks, W. H. Collier and Co., Ltd., and London Brick Co., Ltd.; metal windows, Crittall Manufacturing Co., Ltd.; sanitary fittings, Stitsons Sanitary Fittings, Ltd.; reinforced concrete, Johnsons Reinforced Concrete Engineering Co., Ltd.; appliance room doors, Rippers, Ltd.; opening gear, Yannedis and Co., Ltd.; sliding poles, C. Smith and Co., Ltd.; ironmongery, W. N. Froy and Sons, Ltd.; balcony railings, Bayliss Jones and Bayliss, Ltd.; metal faced partition, Venesta, Ltd.; folding garage doors, Potter Rax, Ltd.; cat ladders to tower, J. Jackson and Co., Ltd.

Hose drying and drill tower.

FIRE BRIGADE STATION AT GRAYS, ESSEX

Typical house for a fireman.



FIRST FLOOR PLAN

View of front elevation. Below : Layout plan.

OLD PEOPLE'S BUNGALOWS AT TENTERDEN, KENT

Surveyor to RDC : G. L. TURNER

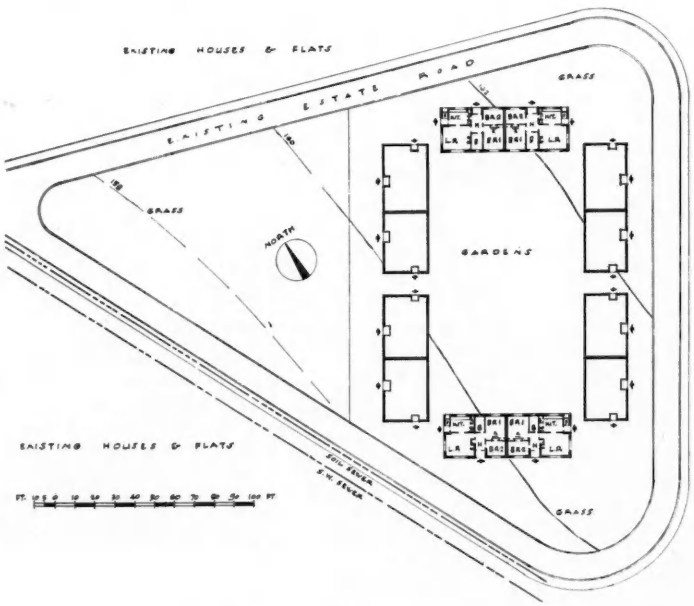
Architect
H. G. HUNT, Dip Arch, ARIBA

Builders
WILLIAM ELLIS (ETCHINGHAM), LTD.

THIS scheme comprises 12 semi-detached elderly people's bungalows grouped together with a central enclosed garden. One plan form was adopted with modifications to suit aspect. The triangular site was existing. Each unit has a single fire only, situated in the living-room, with back boiler connected to an indirect cylinder in the linen cupboard, and provides hot water to the sink, lavatory basin, bath and also the main bedroom radiator, which is separately controlled. Wardrobe and store cupboards are provided including fuel store and dustbin recess. Traditional construction was adopted to conform with the surrounding development. Some variety in elevational treatment was introduced by variations in the facing bricks. Following is a list of nominated suppliers and sub-contractors :—

Electrical installation, Wm. Ellis (Electrical), Ltd., Etchingham, Sussex ; floors (Accotile) laid by Neuchatel Asphalte Co., Offham, West Malling, Kent ; roofing (Marley Ludlow) tiles fixed by Hall and Co., Folkestone, Kent ; sanitary goods, J. H. Sankey, Ltd. ; kitchen fitments, Channel Woodcraft, Ltd., Folkestone, Kent ; flush doors, Gliksten Doors, Ltd. ; other joinery, Howard Bros., Ltd., Battle, Sussex.

Ironmongery, G. H. Brooker, Ltd., St. Leonards-on-Sea ; Redfyre stoves and tiled surrounds, supplied by Louis G. Ford, Bexhill-on-Sea ; windows, Henry Hope and Sons, Ltd. ; glazing, Hastings and Folkestone Glass Works, Ltd., Hastings ; asbestos gutters and r.w.p's, Turners Asbestos Co., Manchester ; paint, Leigh, Ltd., Bolton, Lancs ; distemper, Walpamur Co. ; quilt insulation, Versil, Ltd., Yorkshire.



Front elevation of the rebuilt houses. Below : Floor plans.

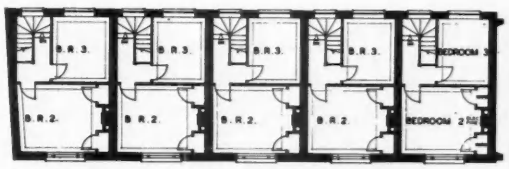
FIVE HOUSES IN MUNSEL STREET, SW1

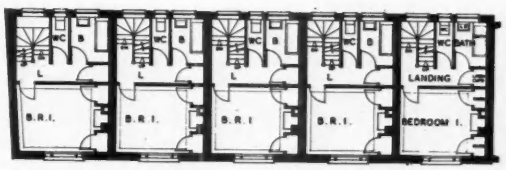
Architects

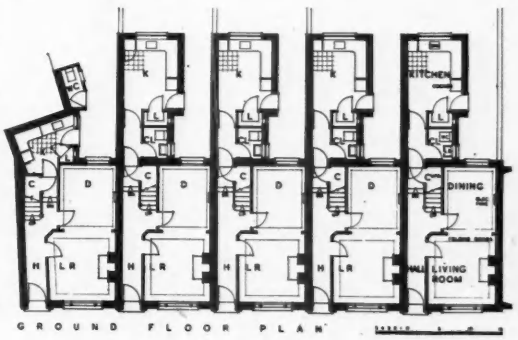
OLIVER LAW & PARTNERS, FF/LRIBA

Builder

CHARLES R. PRICE







THE problem in this scheme was to build five small houses on the site of three old-fashioned demolished houses, trying, as far as possible, to incorporate modern ideas of planning, etc.

The old basements were filled in and the kitchen and living-room accommodation was therefore all planned at ground-floor level. It was also necessary to carry on the buildings at approximately the same height as the existing buildings and to plan the elevations in character with the adjoining property.

As can be seen from the photograph, a very simple treatment was evolved and the general effect was quite pleasing. Attention is also drawn to the " window box " treatment which was incorporated at ground level to fill in the space between the pavement and front wall which was formerly occupied by the area and steps to cellars. By co-operating with the local authority it was agreed to erect a dwarf wall and the soil therein could be either planted or grassed in accordance with the owner's wishes. The accommodation was as follows:

Ground floor.—Living-room and dining-room combined with folding doors or curtains between, with cloakroom and kitchen at the rear. On the two floors above were three bedrooms, bathroom and separate wc.

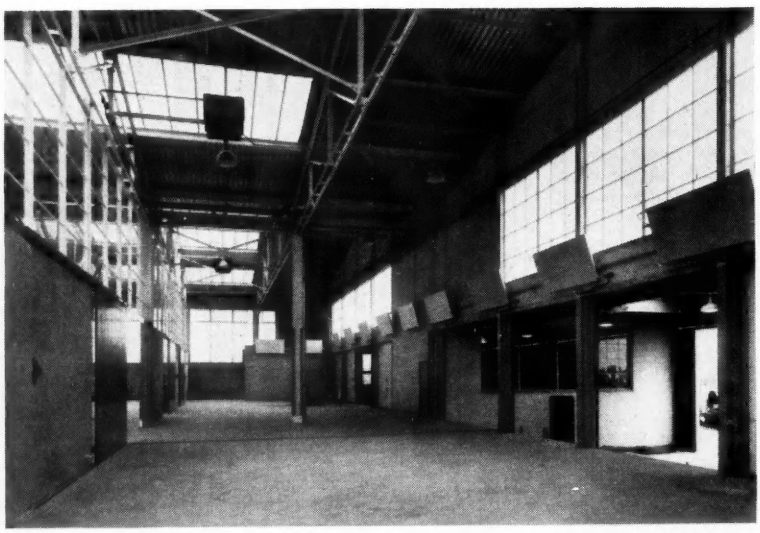
General view of the factory.

FRUIT JUICE FACTORY AT CHELMSFORD

WHAT is claimed to be the world's largest and most modern fruit juice bottling factory was recently completed at Chelmsford for BRITVIC (British Vitamin Products, Ltd.). The architect was Mr. A. B. Waters, GM, MBE, FRIBA (Llewellyn Smith and Waters).

The factory, which covers some 113,000 sq. ft. and cost £380,000, was erected by CAS (Industrial Developments), Ltd., in 47 weeks, in spite of bad weather. The development was carried out by the system evolved by Mr. C. A. Samuels, managing director of CAS (Industrial Developments), Ltd., under which the company find sites, design industrial buildings, put them up, and then lease them to industrialists.

Form of Construction of Main Factory Building. The building is 600 ft. long and 150 ft. wide; it has two bays of steel-frame construction with stanchions at 15 ft. centres and a clear span of 75 ft. to each bay. The clear height to trusses is 20 ft. External walls are of 9-in. Leca block rendered externally and finished internally with self-coloured vermiculite plaster. Above the walls are continuous glazed steel sashes, the upper portion being adjustable for ventilation. The upper part of the walls is formed with "Q" panels (insulated metal wall panels with aluminium externally). The roof is of aluminium decking with two layers of felt on insulation board. Steel columns are carried on independent concrete foundations. External walls are carried on reinforced concrete foundation beams spanning from one stanchion base to another.



Interior view of loading bay.

GROUP FACTORY SCHEME

TCPA Discussion

A TALK entitled "Group Factory Plans for Small Industries," was given by MR. ERNEST HOLDEN of the National Union of Manufacturers at the Planning Centre, Town and Country Planning Association, 28, King-street, WC2, recently. The following is an extract from Mr. Holden's talk:—

Owing to the incidence of widespread planning development many thousands of industrialists are faced with the difficult and expensive problem of re-location of their factories. In the Midlands in particular over 60 per cent. of the industrialists employ less than 20 workpeople and, as the smaller firms manufacture goods, components, and accessories for the larger concerns, the proximity of the larger firms is essential.

A factory colony scheme has been presented to the Birmingham and Wolverhampton Corporations which it is anticipated will be shortly initiated within the Birmingham area. The scheme briefly is as follows:—

Factory colonies should be set up as near to ring roads as possible. Such colonies should contain not less than 20 factories, with a maximum of 40. The placing of factories around a ring road has the advantage that public transport would be able to avoid the centre of the town or city. Furthermore, buses would not return empty during peak hours. The transport of goods would be facilitated, and the supply of heavy goods to factories would be speeded up. It would also ensure that industrialists would not be removed any great distance from their present location. The factory colony scheme envisages that collectively industrialists would be able to borrow sufficient money to build their factories, and many financial houses have already expressed their willingness to finance such a project. If factories are grouped together, and small manufacturers could occupy a large building sub-divided to their individual requirements, this would avoid marginal wastage. Economies would also be effected in the cost of laying down underground services. The resulting economies in the cost of building, etc., could be applied with greater advantage to a higher quality standard of building and more generous welfare arrangements.

Many of the rural district authorities in the Midlands have shown interest in this scheme. They have undoubtedly a desire to attract industry in order that they may become more self-sufficient, and avoid the prospects of unemployment in the event of a recession of trade. But, unless they are prepared to take a fair cross-section their appeals will not be taken seriously even by light industry. It would prove to be a great attraction to industrialists who are faced with dispossession if the rural authorities would be prepared to accept both heavy and light industry to create the necessary balance.

It is inevitable that industry will have to be dispersed to absorb all available labour, and to be located where there is sufficient land to allow for future expansion. Modern architecture is fully capable of designing attractive factory buildings, and to avoid any detriment to the amenities and with the breaking down of the skills in industry, inexperienced workpeople can readily adapt themselves to factory life.

News of the Week

KENSINGTON TOWN HALL

MR. E. Vincent Harris, OBE, RA, FRIBA, has been retained by Kensington Borough Council to prepare a scheme for a new town hall and central library to be erected on the Abbey site in Hornton-street. He has intimated that he will require four to five months for the preparation of the preliminary plans.

Mr. Harris was responsible for the Surrey County Hall, including the extension after the war, and numerous other municipal buildings, and also the new Government offices in Whitehall. He was awarded the Royal Gold Medal for Architecture in 1954.

PLANNERS' TOUR OF CONTINENT

MEMBERS of the Town and Country Planning Association, and their friends, will this year spend nearly three weeks visiting the Netherlands, Ruhr and Rhineland. Leaving London on August 24, seven days will be spent in the Netherlands, staying at Scheveningen, Amsterdam and Arnhem, visiting new development schemes and surrounding towns and cities old and new. From there the party will travel through Germany, stopping at Essen, Cologne, Coblenz, Maastricht and back to London via the Hook of Holland, on Sunday, September 11. Details are available from the Secretary, 28, King-street, Covent Garden, WC2.

SOHO HOUSING SCHEME

SKETCH PLANS of a building proposed to be erected in Soho which would contain shops, workrooms and about 58 flats were placed before Westminster City Council at its meeting yesterday (Thursday). The building would be occupied by families and businesses displaced under the council's slum clearance plan.

The site would be about three-quarters of an acre between Berwick-street and Hopkins-street. It would involve the acquisition of property on either side of the space where St. Luke's Church once stood.

The council were recommended by the housing committee to make a compulsory purchase order for the church site and other properties involved.

LANCASTER HOUSE RE-OPENED

THE State Apartments at Lancaster House, situated at the junction of the Mall and Green Park, will be re-opened for public viewing on Saturday and Sunday afternoons, starting on April 9. The State Apartments will also be open on Whit Monday and August Bank Holiday. Visiting hours will be from 2 p.m. to 6 p.m.

DECASUALISATION OF LABOUR

IN A BOOKLET entitled "Must We Always be Casuals?" Mr. D. M. Jones, Secretary of the Building Trades Group in No. 1 (London) Region of the Transport and General Workers' Union, pleads for the decasualisation of building labour. He claims that any solution of the problem in the building and civil engineering industry must be related to some form of registration and a guaranteed weekly payment, and suggests that a National Registration Board should be set up and made responsible for securing the necessary manpower for the industry. The booklet may be obtained, price 3d., from Mr. E. Brewer, 3, Tremadoc-road, Clapham, London, SW4.

PROFESSIONAL ANNOUNCEMENTS

MESSRS. WALTER W. GREEN AND PARTNER, quantity surveyors, have moved their offices from 163, High-road, Wood Green, London, N22, to 396, Seven Sisters-road, Finsbury Park, London, N4 (tel.: Stamford Hill 0617/8).

MESSRS. FREDERICK S. SNOW AND PARTNERS, of Monro-building, Wellington-street, London, WC2, consulting engineers, have taken into partnership the following members of their staff: MESSRS. ARTHUR H. BROWN, AMIMech.E, MSoc.CE(France); ERIC W. COOPER; and NORMAN J. PAYNE, MBE, BSc.(Eng.), AMICE, ACGI.

FROM "THE BUILDER" OF 1855

Saturday, April 7, 1855

NEW CHURCH IN ST. JAMES'S.—It is stated that a parishioner of St. James's, Westminster, has offered to the rector the sum of £4,000 towards the erection and endowment of a church in that parish, on condition that not less than 500 of the sittings shall be free and well situated, that the services of an additional clergyman shall be secured to the parish, and that a suitable site shall be provided within three years.

BRITISH ARCHITECTS' CONFERENCE

THE British Architects' Conference is to be held this year at Harrogate from June 8 to 11. Following is an account of the arrangements for the conference:—

Headquarters: The Headquarters of the conference will be at the Majestic Hotel, Ripon-road, Harrogate (telephone Harrogate 2261). Members should call at the conference office there as soon as possible on arrival to obtain badges, information, etc., and to give their addresses in Harrogate, if not previously notified. The conference office will remain open until 8 p.m. on June 8.

Until June 6 all correspondence on the subject of the conference should be addressed to the secretary, RIBA, 66, Portland-place, W1, and thereafter to the Majestic Hotel, Harrogate.

Car parking: Members who intend to travel to Harrogate by car and to use their cars during the conference may be provided with windscreen labels which will give them free parking facilities in Harrogate. Space is provided on the application form for members to indicate whether they wish to have parking labels. They will be sent out with the conference ticket books.

Exhibition: During the conference an exhibition will be arranged in the Royal Hall, consisting of illustrations of work carried out in the area of the West Yorkshire Society of Architects, and including work from the recognised and "listed" schools in the area.

Golf, fishing: For those members attending the conference who may wish to prolong their stay in Harrogate and are interested in fishing or golf, there are excellent facilities available, particulars of which can be obtained from Mr. W. H. King, hon. secretary of the West Yorkshire Society of Architects, 11a, Cavendish-road, Leeds, 1.

PROGRAMME

Wednesday, June 8.—An informal reception will be held at the Majestic Hotel, Harrogate, at which members will be the guests of the West Yorkshire Society of Architects. Light refreshments, music, informal dress. 9-11.30 p.m.

Thursday, June 9.—The inaugural meeting will be held at the Royal Hall. Reception and address of welcome to members by the Mayor of Harrogate. Address by Mr. C. H. Aslin, CBE, president RIBA, followed by papers on "The Organisation of the Building Industry and the Architect's Responsibilities," by Sir Thomas Bennett, KBE, FRIBA, and Mr. D. E. Woodbine Parish, past-president, London Master Builders' Association. 9.45 a.m.-12.30 p.m. Members and guests will make their own arrangements for lunch.

Garden party at Harewood House, by permission of HRH the Princess Royal. It is hoped to arrange a cricket match—Yorkshire *v.* The Rest. 2.45 -5.30 p.m. Coaches will leave conference headquarters at 2.15 p.m. and will return from Harewood at 5.30 p.m.

Civic reception and dance at the Royal Hall, by kind invitation of the Mayor and Corporation of Harrogate. Evening dress, decorations, presidential badges. 8.30 p.m.-midnight.

Friday, June 10.—Papers continued at the Royal Hall on "The Organisation of the Building Industry and the Architect's Responsibilities," by Sir Thomas Bennett, KBE, FRIBA, and Mr. D. E. Woodbine Parish, past-president of the London Master Builders' Association. 10 a.m.-1 p.m. Members and guests will make their own arrangements for lunch.

ALTERNATIVE HALF-DAY TOURS

Tour No. 1 (2.15 p.m.).—Headquarters—Pannal—Harewood—Leeds (tour, arranged by the City Architect, of rehousing schemes, flats, development areas—tea at Temple Newsam)—Wetherby—Spofforth—Headquarters at 5.30 p.m.

Tour No. 2 (2.15 p.m.).—Headquarters—Knaresborough — Wetherby — Bardsey — Wakefield (tour arranged by the West Riding County Architect to the new County Architect's offices—survey of architectural work)—(tea)—Aberford—Bramham—Boston Spa—Wetherby—Spofforth—Headquarters at 5.30 p.m.

Tour No.3 (2.15 p.m.).—Headquarters—Knaresborough — Ferrensby — Minskip — Boroughbridge — Skelton—Newby Hall (Adam interiors, works of art, gardens of high repute)—(tea)—Ripon—Wormald Green—Ripley—Headquarters at 5.30 p.m.

Tour No. 4 (2.15 p.m.).—Headquarters—Ripley—Bishop Thornton Road—Fountains Abbey and Hall—Studley Royal—Ripon (tea)—Wormald Green—Headquarters at 5.30 p.m.

ALTERNATIVE WHOLE-DAY TOURS

Tour No. 5 (10 a.m.).—Headquarters—Ripley—Sawley—Grantley—Masham—Middleham or Leyburn (lunch) — Wensley — Aysgarth—Buckden—Burnsall—Bolton Abbey — Blubberhouses — Headquarters at 5.30 p.m.

Tour No. 6 (10 a.m.).—Headquarters—Knaresborough—Green Hammerton—arrive York at about 11 a.m. (Guides will be available to take parties on tours of York including the Minster, City Walls, Castle Museum, The Shambles, Castle Gate, etc. Lunch 1 p.m., tea 4 p.m.)—Acomb—Rufforth—Marston Moor—Wetherby—Spofforth—Headquarters at 5.30 p.m.

Conference dinner: Conference dinner at the Majestic Hotel. The guests will be received by the president, RIBA, and the president, West Yorkshire Society of Architects. Evening dress, decorations, presidential badges. 7.45 p.m.

Saturday, June 11.—Informal visits to places of interest. Information will be available at the conference office.

COMPARISONS IN STRUCTURAL STEELWORK

A Science Lecture at the Royal Institute of British Architects

IF one examines most of the structural steelwork of the present day, one finds that it has not progressed far beyond the pillar and beam construction by which the ancient Egyptians produced such enduring results, PROFESSOR W. FISHER CASSIE, FRSE, MICE, MIStructE, said in the course of his Science Lecture on "Comparisons in Structural Steelwork," given jointly by him and Mr. D. W. Cooper, AMIStructE, at the Royal Institute of British Architects, 66, Portland-place, W1, on March 22. The chair was taken by Mr. Basil Spence, OBE, ARA, vice-president, RIBA.

Professor Cassie devoted the first part of his paper mainly to a consideration of the work carried out by the Steel Structures Research Committee from 1930 to 1936, on the elastic range of steel structures. He continued:

There is no doubt that the only sound method of structural steel design *in the elastic range* is that given by the Steel Structures Research Committee's investigations. The fact that this method shows neither economy nor simplicity does not discredit it, but merely indicates that the criterion used as a guiding principle cannot lead to much more economic design than do the rule of thumb methods of an earlier generation. That criterion was that at no point in a structure must the stress rise above a defined "safe" value. We must search for another.

What then is the answer? It was clear, in those seven pre-war years, that the moments acting in beams and stanchions depend closely on the properties of the sections which comprise the different parts of the frame. If the beam-to-column connections were rigid or semi-rigid no one beam or one stanchion length could be designed independently of the others; the structural frame had to be considered as a whole. Loads on one beam, for example, or wind forces on one column were not supported by that member alone, but affected stresses in distant parts of the frame.

With this already well-understood idea as a clue and with the failure of their elastic design proposals as a spur, the designers went on to study not safe stresses at isolated points of a frame, but rather the safety of the whole frame against collapse. Like many revolutionary ideas this one seems in retrospect to be obvious and simple. The effect it has had, however, on the appearance and weight of structural steelwork in the few buildings yet erected—the first physical manifestations of this new idea—is much more striking than that produced by the complex rules of the Steel Structures Research Committee's Reports.

THE NEW CRITERION

The simple idea, that the new criterion in design should be not a "safe" stress but the collapse load of the whole structure, would not have produced the striking results it has, if it had not been for the brilliant work done at the University of Cambridge, where Professor J. F. Baker and his teams have, for years, been working on the theoretical and experimental development of the new conception.

Under the older conception, using the criterion of a "safe" stress, the "unsafe" range of loading was that which produced a yield stress at some point in a beam or column. If loading is continued beyond this point more and more of the metal in the member reaches the plastic state and deforms without increase in stress. The outer fibres of the section where stress is highest are, naturally, affected first, but finally the whole thickness of the member from top to bottom reaches a plastic state. In this condition the section of high stress at which plasticity has been reached can be considered as a hinge, free to rotate through a small angle and offering no resistance to movement.

"Hinges" also develop at other points where the stress rises as the load increases and, in the end, when sufficient plastic zones appear, the structure collapses. It is then, technically, a mechanism with one degree of freedom. From the bending moment diagram of, say, a portal frame, it is clear that at the joints between stanchions and rafters and at points of loading there are high stresses caused by large bending moments and at any of these points, as the load is gradually increased, plastic hinges may develop. Four or more of these hinges may be required to cause complete collapse depending on the type of portal, and these hinges may occur in different combinations according to the relative stiffness of the beams and columns. It is the task of the designer to estimate in advance which mode of collapse will actually take place and so decide on the true collapse load of the structure. This load, divided by an agreed load factor, gives the working load which can be safely carried by the structure.

VIERENDEEL FRAMES

During the past few years a particular study of plastic failure has been made on model vierendeel frames in my department. The work, which consists of an investigation of vierendeel frames loaded up to plastic failure, has been conducted by S. Henderson, and supervised by Mr. Cooper, my fellow-author. Several interesting points have been established in these investigations.

It has been found, for example, that contrary to all expectations, a plastic zone develops, not only in the material *near* a joint, in column or beam, but actually *in* the material of the joint itself, even if the joint is much stiffer than the members composing it. Also, because of the extra stiffness afforded by short vertical members of a shallow vierendeel frame, deflection under a given load increases with increasing depth over a range of truss proportions. This, again, is contrary to expectation, for we are accustomed to finding that a greater construction depth results in decreased rather than in an increased deflection. If, within defined limits of proportion, shallow beams of the vierendeel type deflect less than the deeper beams, a much wider field of structural and architectural design is opened up. We have called this phenomenon, the "Cooper effect"!

Models, of course, cannot be expected to yield comprehensive answers, but through the valuable co-operation of Mr. A. Dean, Chief Civil Engineer to the North Eastern Division of British Railways, we hope soon to have specially fabricated full-scale vierendeel frames of the type used in signal gantries. Tests of these should yield valuable results.

The load factor against complete collapse of a beam of "I" section simply supported and designed in accordance with BS 449 (1948) is 1.75 and it is thus consistent and logical to use a load factor of similar value in the design of more complex structures. Assuming then that the collapse load of a structure is somewhat less than twice the working load, and that the value of the collapse load can be determined in advance of construction, we find that plastic design methods result in lighter and more economical steel frames.

LIGHTER SECTIONS

It is noticeable that the sections used in buildings designed by the plastic method are not only lighter but also more uniform in size than is usual with conventional design. This uniformity tends to maintain working stresses low and normally within the elastic limit. If there is, at any joint, an abrupt change in section there is more likelihood of plastic stresses being developed at working loads. Permanent strains at points of high stress, and larger deflections are, of course, more likely to develop than with conventional design, and the deflection rather than the strength of a frame may sometimes be the governing factor.

To some it seems likely that the day of elastic design of structural steelwork, as we now know it, will soon be over, except for construction where deflections and sway are important.

But is even plastic design the final stage? The first step in further development of creative thought in structural steelwork is probably to imagine even the simplest multi-bay, multi-storey steel frame as a three-dimensional entity rather than a series of two-dimensional frames linked together.

What, then, is the relationship between the collapse load of a bare frame and that of the building it supports? No one can give the complete answer, but Dr. R. H. Wood, of the Building Research Station, and his colleagues have been working steadily on a study of the strength of composite structures. They have measured stresses in buildings under construction—notably the new Government Buildings in Whitehall—and have confirmed what had long been suspected, that even light cladding of buildings stiffens them tremendously and that the true value of the strength of steel-framed structures will not be determined until we think both in three dimensions and in terms of the whole building.

We are at the stage now of being closer than ever before to a true understanding of the behaviour of steel frames. The approaching publication of both the second volume of Professor Baker's book *The Steel Skeleton,* and of a National

Building Studies Research Paper "Studies in Composite Construction, Part 2" point the way in which creative thinking is tending.

Better Ways of Using Known Materials

THE SECOND PART of the lecture was read by MR. D. W. COOPER, AMIStructE. He devoted his remarks to the progress made in using known materials, and for improvements in those materials. Mr. Cooper said:—

Since the late war there has taken place increasing use and development of cold-formed sections. As the name implies these structural sections are fabricated from strip steel without the application of heat. The strip is supplied (from Margam) in rolls, usually in widths of 36 in., and perhaps weighing some 4 tons each. Machines at present in use handle strip up to 10 in. wide, and the first process of manufacture is to shear the material to required width, after which the material is fed through successive rolls each one impressing a little more of the required shape until, after the last, the required section emerges.

With processes such as these the designer has at his disposal an unlimited variety of shapes to apply to his requirements, and he may of course devise his own sections. As a result the weight of metal required to do a certain job is reduced very much below what can be achieved with hot-rolled sections, particularly for small and medium spans. For spans of 25 to 50 ft. a saving in cost of 18 to 20 per cent. is claimed over the cost of conventional forms, as delivered to site. In site handling of course the light-weight structure scores by saving up to 25 per cent. of the cost in fixing trusses.

For the architect the cold-formed section offers a clean external appearance ready for painting, and when used in schools and the like, it does not require casing. Fenestration can be secured directly to stanchions.

USE OF TUBES

Parallel with the development of cold-formed sections has grown the use of tubes. In contrast to the cold-formed sections the tube offers the designer only a choice of diameter and wall thickness, although a large number of both are produced, diameters ranging from 27/32 in. to 12¾ in., each diameter being available with six or seven wall thicknesses. The tube is well known for its high stiffness/weight ratio. As in the case of cold-formed sections most connections are made by welding, so that the frames so made gain not only by reason of their low self-weight but also because of the tremendous stiffness resulting from the welding technique.

The foregoing notes have probably given the impression that the hot-rolled sections we have come to know so well are now only museum specimens. It is therefore interesting to look last at our old friend the RSJ. So far, ideas have been mentioned borrowed from the motor and aircraft industries, so it will hardly come as a surprise to know that from the shipbuilding world comes the idea of the castellated beam, originally the invention of Mr. G. M. Boyd. The successful application of flame cutting enables an ordinary RSJ to be cut along its web to a regular pattern. The upper and lower halves of the beam are then separated and re-welded so that a series of perforations is formed in the web. The result is a unit no heavier than the parent section but one and a half times as strong in bending and nearly twice as stiff. To the architect is offered the possible use of exposed perforated webs as a feature of his building, and the undoubted advantages of being able to run services through the apertures provided.

We find, then, a change in two directions—first, in the newer conceptions employed in determining the safe condition of loading for a building, and secondly, in the use of new sections and new methods. Development is by no means complete, and the buildings already erected in cold-formed sections, in tubes, in castellated beams in three-dimensional constructions, and pre-stressed steelwork are indications of the amount of ingenuity and imagination which is being applied to that commonplace of modern architecture—the steel frame. Perhaps we may still be able to place it alongside the more flamboyant examples of the modern miracle, and claim for it a place as at least one of the minor wonders of the world.

"LETHABY AND HIS TIMES"

The Fourth Lecture

BASIL WARD, FRIBA, Hon. ARCA, Lethaby Professor of Architecture at the Royal College of Art, gave the fourth lecture in this series on March 28 at the Victoria and Albert Museum. His theme on this occasion was that 19th-century English political philosophy encouraged new concepts of freedom in Europe; and that with this went the Arts and Crafts Movement and the beginnings of the downfall of Historicism in architecture.

One has periodic occasion to be thankful that, so far, architectural history remains largely the province of architects who are both scholarly and practising. Those fortunate and (with respect to their erudition) rather dangerous fence-sitters, the art-historians, are seldom called upon to fire a shot in anger, as it were, by way of expressing a personal preference or assessment of merit. Basil Ward is, by contrast, one whom architects can trust to put in perspective the milestones of a movement which recedes not only into the past but also into some pretty tangled bye-ways, and he is (fortunately for us) unable to keep the process quite coldly impersonal or a mere matter of docketing and filing.

Such milestones are apt to be thrown up by non-recurring concatenations of circumstances: the significance of what they said or did lay for them in the time at which it was done, and it might surprise them to find how much has been said and written about it since. Though I do not think the analogy needs apology, one is reminded, *apropos* the documentation of pace-setters, of the famous jazz musician who, confronted with pages of music transcribed by a system of high-speed shorthand notation while he played it, said "Man! did Ah really play *all that?*" Perhaps Lethaby's ghost (which one is assured haunts a well-known school of art) would echo the question and the surprise, though in other accents!

Throughout the series, Basil Ward has not, I think, overrated the significance of some of the outward similarities of Lethaby and his contemporaries' work. Their finding and recording, along with some motif-matching, has been an incidental part of his researches. He would agree, one feels, that a bullrush by Lethaby is superficially like a bullrush by Walter Crane, and also even by the man who painted a hunting-scene in an Etruscan tomb—a matter of adopting a convention for manual convenience with no thought of thereby founding an aesthetic, or even an art-form. It is, as Ward has stressed in a previous Lethaby lecture, what lies behind that counts, and this cannot be shown by slides.

But some indication of prophetic vision is given by Lethaby's telling an AA audience in 1915 that what he called England's "free" architecture was being closely watched on the Continent, and Ward reminded us how interesting it is to speculate on what might have happened had that freedom not been nipped in the bud by war and, abroad, stultified by totalitarian concepts—the morning after the hectic night before, as Ward put it. Again, the "mass-man" emerging with Europe's enormous middle-class population-growth (with which mass enlightenment failed to keep pace) provided a poor substitute for the intellectual climate engendered by the cultured private patron—though, quoting Holbrook Jackson, Ward mentioned the "yellow Press *vs.* Yellow Book" even then representing the extremes of the layman's yardstick—two vastly different versions of "public reaction" which unfortunately persist.

INTERESTING SLIDES

A particularly interesting collection of slides, including some which might have seemed comparatively trivial "wayside signs" out of such a well-documented context, illustrated the continuity and cohesion of a forward movement internationally preoccupied with a rediscovery of natural forms. A series of four showed, in microcosm, its development in Finland—successively classical, romantic to the point of medievalism, "free" and finally identifiably "modern" from which it is still stemming. Further detail of Gaudi's work, with other premonitions of *l'art nouveau*, helped us to follow the theme by alternating the particular with the general.

This fourth lecture leads up to discussion of the Modern Movement of the 20's and 30's in Lecture V by Professor Ward later in the year. It is understood that the series is eventually to be published.

BASIL MARRIOTT.

IN PARLIAMENT

Compulsory Acquisition of Land

DURING a debate on a private member's motion on the compulsory acquisition of land, in the House of Commons on March 25, in which there was considerable criticism of the procedure involved, MR. HENRY BROOKE, Financial Secretary to the Treasury, said that the Government would watch how the Town and Country Planning Act, 1954, worked, but hoped that all would agree that it was too early to think of getting into the colossal trouble of amending that Act.

No one, he said, had suggested that the country could do without compulsory purchase. Everyone looked forward to the day when there might be new motor roads in the country, and hoped that they would not be directed hopelessly out of what would normally be their course because of the absolute refusal of some particular owner to part with his property under any circumstances. The House desired that the Cromwell Road extension should proceed to enable people to get into and out of London in an easier manner, but without compulsory purchase those public needs would not be served. He agreed that justice to the individual must prevail over administrative convenience, but the public advantage had to be supreme. What was required was finding the means to ensure the proper balance so that the public advantage was served but injustice and hardship to individuals was as far as possible avoided.

They must not act too hastily in this question of compulsory purchase, yet the procedure must not be so slow that an interminable uncertainty hung over everyone. Neither Ministers nor local authorities should seek to make compulsory purchase orders where they were not absolutely necessary. The Minister must take the final decision; it was a political decision and could not be escaped from. When the Minister made his decision he had to bring everything into account. He had to consider the need to acquire the land for the particular service. He had to consider the cost, the suitability of the land, the nature of the objections, and the weight to be given to them, and had to make up his mind whether those objections were so strong, even if he were satisfied on the first three conditions, that the order should be rejected.

Matters of designation were for the Minister of Housing and Local Government. Hardship arose not because land was compulsorily purchased, but in the period until it was, or was not compulsorily purchased. Compensation in all normal cases now took place under the 1954 Act. It was based on existing use value plus the unexpended balance of the established development value. He hoped that it would be agreed that they should give time for that Act to operate so that they could see how things worked out. It had been passed to enable them to escape the chaos caused by the development charge. If members applied their minds to the case of an authority seeking to acquire land for a new road in the neighbourhood of a new town, they would realise that it would be somewhat unfair if the authority had to pay full market value in every case for such land when that value had been greatly improved by the creation of the new town, also at the public expense. Under the 1954 Act, one might get less than market value, or one might get more, but the Government would watch how the Act worked. He hoped everyone agreed that it was far too early to think of getting themselves into the colossal trouble of amending it. He was not closing any door. The Government would study carefully everything that had been said in the debate.

OTHER BUSINESS

NEW SCHOOLS, AYRSHIRE

On March 15, MR. WILLIAM ROSS asked the Secretary of State for Scotland if he would state the number and the types of new schools started in Ayrshire since January, 1952; and how many were in Kilmarnock.

MR. STUART said that construction had started on one new primary and two new secondary schools, as well as on three major extensions to existing schools. Of these, one new senior secondary school was in Kilmarnock. He added that approval had been given to four new primary schools, three secondary schools and three major extensions to existing schools.

REPAIRS AND RENTS ACT

MR. BLENKINSOP asked the Minister of Housing and Local Government whether he had considered the request, a copy of which had been sent to him, made by the National Federation of Property Owners for the repeal of the Housing Repairs and Rents Act, 1954, in view of its failure to secure necessary and urgent repairs to property; and whether he would introduce amending legislation to this effect.

MR. DUNCAN SANDYS, in a written reply on March 22, stated: I have noted what the Federation have said in their memorandum, but I think it is still too early to assess the effectiveness of this Act.

BUILDING RESEARCH

MR. FREDERICK WILLEY asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, what proposals he had made to the building industry concerning their making a greater contribution to the work of the Department of Scientific and Industrial Research Building Research Station.

MR. BEVINS stated, in a written reply on March 22: In their report for 1953-54, the Advisory Council for Scientific and Industrial Research expressed the view that the building industry ought to make a greater contribution to building research. The Lord President of the Council has no doubt that the industry, which now makes substantial use of the Building Research Station, will take careful note of the views of the advisory council.

THE NEW LONDON TUBE

On March 23, MR. ALBU asked the Minister of Transport and Civil Aviation whether he would reconsider his policy on the proposed Route C tube, in view of the strongly expressed opinions of the Committee of Inquiry into London Transport.

MR. BOYD-CARPENTER.—As a necessary step in the detailed planning of this route, powers to construct are contained in the British Transport Commission's Bill now before Parliament. No decision can be taken with respect to construction until this preliminary work has been done. This seems to me wholly consistent with the report of the recent Committee of Inquiry into London Transport.

COMMUNITY CENTRES, SCOTLAND

MR. EMRYS HUGHES asked the Secretary of State for Scotland when he proposed to make a statement announcing his proposals for giving increased financial assistance which would enable local authorities to erect more community centres in new housing schemes.

MR. JAMES STUART, in a written reply on March 24, stated.—The estimate, which has just been published, of £50,000 for grants in Scotland under the Physical Training and Recreation Act, 1937, shows an increase of £15,000 over the current year's Vote: this will enable more community centre schemes to be directly assisted. In addition, more money is to be available next year in the Education (Scotland) Fund, from which grants are paid on contributions by education authorities towards the cost of such projects.

FLY ASH IN BRICKS

MR. DODDS asked the Minister of Works what practical application had been made of the successful experiments at the Building Research Station of producing good quality bricks from 85 per cent. pulverised fuel ash waste at power stations and 15 per cent. clay.

MR. NIGEL BIRCH, replying on March 29, said: The large-scale application of the results of these experiments raises technical and economic problems which the brickmakers are considering. Some brickmakers are now using a small proportion of fly ash in their regular production.

MR. DODDS asked if the Minister was optimistic about the future of this proposal.

MR. BIRCH said that it was not an easy one. It was not economic to transport fly ash great distances; one had to have a situation in which there was suitable clay and fly ash available.

SCHOOLS UNDER CONSTRUCTION

MR. SWINGLER asked the Minister of Education how many new schools were under construction at the latest date for which figures were available; and how this figure compared with the numbers for 12 months, and two years ago, respectively.

SIR DAVID ECCLES, in a written reply on March 29, said that the number of new schools under construction on February 1 of each of the last three years was:—

	Primary	Secondary
1953	665	321
1954	533	353
1955	372	414

HOUSING LOAN CHARGES

MR. ALBERT EVANS asked the Minister of Housing and Local Government how many local authorities had complained to him about the higher housing costs resulting from the recent increase in interest charges; and what had been the general tenor of his replies.

MR. SANDYS stated, in a written answer on March 29: Up to yesterday, seven. Only one reply has so far been sent. It referred the council to my statements in the House on this subject.

COMPENSATION PAYMENTS

CAPTAIN KERBY asked the Minister of Housing and Local Government if he could state when the Land Board would commence authorisation of immediate payment of compensation under Part I of the Town and Country Planning Act, 1954, to persons whose land had been acquired by local authorities and others at restricted price under the Town and Country Planning Act, 1947, and whose claims for compensation had been previously agreed with the Land Board.

MR. SANDYS, in a written reply on March 28, stated: The Central Land Board have already made 1,761 payments amounting to nearly £4,000,000 to persons whose land was sold at a restricted price. Many more payments of this kind have been determined and will be made as soon as the statutory time for appeals has expired.

ATOMIC POWER STATIONS

MR. JANNER asked the Minister of Works if he was aware that some of the large engineering firms in the country had announced the formation of a joint team of nuclear physicists, engineers and boiler technicians to study the problems of designing larger and more powerful atomic power stations for industrial nuclear power development; and if he would appoint liaison officers to maintain contact between this team and Government departments.

MR. BIRCH, replying on March 29, said: These teams have been formed by the firms concerned under the auspices of the Atomic Energy Authority and the Electricity Authorities to work on the design of the nuclear power stations in the ten-year programme outlined in the recent White Paper.

NORTHERN IRELAND BUILDING

MR. MCKIBBIN asked the Secretary of State for War on March 29 what establishments in Northern Ireland he had included in his plan for spending £15m. in the next three years in building and modernising barracks and military hospitals.

MR. ANTONY HEAD replied: We plan to begin modernising Palace barracks, Holywood, and the Infantry depots at Omagh and Armagh, to complete Thiepval Barracks, Lisburn, and to start work on a new military hospital, also at Lisburn.

PROVISION FOR EMBASSIES

MR. READER HARRIS asked the Minister of Works if he was aware that the British Embassy building in Monrovia, Liberia, was in a lamentable state of disrepair, and that a new building was required which would compare favourably with other embassies in that capital; and what action was proposed.

MR. BIRCH replied, on March 29: I am aware that this Embassy is not all that could be wished, but a good deal has been and is being done to maintain it despite its age and the climate. A new Embassy will be built as soon as more urgent requirements elsewhere have been met.

MR. IVOR OWEN THOMAS asked the Minister of Works if he would explain in detail the main items included in the total estimates of £1m. in Civil Estimates for the year ending March 31, 1956, in respect of proposed works, under Foreign Office, Item 4, Washington; Erection of Embassy offices.

MR. BIRCH stated: It is proposed to build offices to house the staff of the Embassy and other United Kingdom Missions in Washington including the British Joint Services Mission.

MR. THOMAS also asked for details of the main items included in the total estimate of £1,500,000 in Civil Estimates in respect of Works in Progress, under Commonwealth Relations Office, Item 11, New Delhi; Acquisition of site and provision of residential and office accommodation for High Commissioner and staff.

MR. BIRCH: The intention is to construct offices for the Mission, a residence for the High Commissioner and accommodation for most of the staff. The work will be carried out over a number of years.

RAIN-WATER PIPE EXPORTS

MR. MALCOLM MACPHERSON asked the President of the Board of Trade to what extent the import restrictions recently announced by Australia were likely to affect exports of cast-iron goods from this country.

MR. LOW, Minister of State, Board of Trade, replying on March 29, said: The Australian quotas for rain-water pipes and certain types of stoves are to be cut by 15 per cent. The category B quotas covering most other cast iron goods are to be cut by one-third. But importers are free to use the Category B quotas on a wide range of alternative goods from a wide range of countries, and it is impossible to forecast the effect of the recent restrictions on particular United Kingdom exports.

PROPOSED HUMBER BRIDGE

MR. E. L. MALLALIEU asked the Minister of Transport and Civil Avaition if he would indicate the priority of the scheme for building a bridge across the Humber.

MR. BOYD-CARPENTER: I have not seen any such scheme in definite form. If the responsible highway authorities submitted one to me I would consider it. I can give no indication of the priority which I could give to such a scheme as against others which have been already submitted to me.

THE REQUISITIONING BILL

An attempt to extend for any period up to five years the life of the Requisitioned Houses and Housing (Amdt.) Bill, in particular in local authority areas where difficulties might arise in the application of the measure during the five years laid down, was resisted by the Government and rejected by 228 votes to 205 in the House of Commons on March 30. The Bill was being discussed in committee on re-committal and on the report stage.

SCHOOL BUILDING PROGRAMME

On March 31, SIR DAVID ECCLES, Minister of Education, answered a number of questions about the amount of new school building within the last ten years.

MR. SWINGLER asked for the total number of new schools and new school places constructed since 1945; and in how many cases building started after October, 1951.

SIR DAVID ECCLES: Between 1945 and February 1, 1955, 1,348,000 school places were provided by new building, including 2,395 new schools. Work on 325,700 of these places and on 582 of these schools started after October, 1951.

MR. GOWER inquired how many new schools were completed from 1945 to October, 1951, and from November, 1951, to 1955; and how far he expected the provision of new school buildings to be maintained or increased.

SIR DAVID ECCLES: 727 and 1,668 schools respectively. I expect that the recent rate of building will at least be maintained.

MR. GOWER asked how many new schools were completed in Wales between 1945 and October, 1951 and between November, 1951, and 1955, respectively.

SIR DAVID ECCLES: 47 and 94 schools respectively.

MR. GOWER asked for a statement on the progress in providing facilities for further technical education in Wales.

SIR DAVID ECCLES: Since the war £2m. worth of new building has been completed at 26 technical colleges and institutions in Wales; a further £1,500,000 worth is in hand or has been authorised.

AIR POLLUTION

After MR. HARRY CROOKSHANK, Lord Privy Seal, had announced on March 31 the programme of business in the House of Commons for the week preceding the Easter recess, MR. ELLIS SMITH asked if he recalled that a private member's Bill dealing with air pollution had been withdrawn on condition that the Government would introduce a Bill on the subject during this session. Was Mr. Crookshank aware, he went on, that unless it was introduced in the near future it would not be passed in the present Parliament, and could the House have some information about it?

MR. CROOKSHANK said that the question of air pollution was being dealt with by the Minister of Housing and Local Government.

POLICE HOUSING

Considerable improvements in the rate of house building by police authorities in England and Wales since the war, were mentioned by MAJOR GWILYM LLOYD-GEORGE, Home Secretary, during a debate on police recruitment and conditions in the House of Commons on March 31.

He said that since the Oaksey Committee reported in 1949, police authorities in England had built more than 11,500 houses, making with those built in the period 1945-49 a total of about 13,000 additional police homes provided since the war. That was more than the total number of police houses which existed in 1939. New houses were being completed at the rate of 2,200 houses a year.

Because of the density of building in London the acquisition of sites was creating particular difficulty. There were still about 10,000 officers in the area urgently requiring quarters, and he was most anxious to see that those men were housed satisfactorily as soon as possible. Everything which could be done would be done.

MR. J. HENDERSON STEWART, Under Secretary, Scottish Office, said that since the publication of the Oaksey report the number of houses built by police authorities had been 1,477, and they were now building houses at the rate of about 250 a year.

MR. CHUTER EDE, a former Home Secretary, urged that more single and fewer terraced police houses should be built.

Parliament rose for the Easter recess on April 7, and will reassemble on April 19.

BOOK

STANDARDISATION, SIMPLIFICATION, SPECIALISATION, IN THE BUILDING INDUSTRY. (Paris: Organisation for European Economic Co-operation.) Obtainable through HMSO, price 12s.

THIS book has been produced by the Division of Productivity and Technological Development who are conducting a series of studies in savings in materials and labour costs resulting from standardisation, simplification and specialisation within the building industry in the USA. It is designed to call attention to advanced practices in the USA, many of which have European parallels, and it is to enable the countries of Europe to benefit from the advanced American studies that this book is made available over here.

The first part of the book deals extensively with the efforts which have been made in the USA towards the standardisation of components. It is interesting to note the difficulties and efforts which have been made, for instance, in standardising brick sizes during the past 30 years. Even to-day changes are being made in sizes to fit in with American ideas on modular co-ordination where they are working on a 4-in. module. As far as this country is concerned much, if not all, of this work has been accomplished through the British Standards Institution, and there appears little for the average reader to learn from the first part of the book.

The second part covers a number of case studies in which the reduction in costs due to various methods has been carefully computed, and this portion might be well worth the study both of architects and builders to enable them to benefit from the information it gives.

Detailed investigation has been made into such items as the cost of standard windows, prefabricated stairs of standard size, prefabricated kitchen fittings, etc. All of these are, of course, available in this country, but it is a useful reminder to everyone of the savings they effect. It would be interesting, however, to have comparisons in these items from some of our own extremely efficient mass-production joinery works.

Items which are almost unknown in this country include a prefabricated floor. In this the flooring is already attached to the joists and the whole is erected at one time, resulting in a saving of some 38 per cent. in the cost of the floor, it is claimed.

Concrete production and placing for a large scheme is also most carefully investigated, and the details of progress show how rapid this can be under planned control. The remark "no plaster was used on ceilings because the plastic-covered plywood forms produced a smooth surface which could be painted," is of interest, and it would be instructive to see comparative figures covering this aspect, as one cannot help feeling that plastering to ceilings is a slow and involved operation.

In the specialist trades of plumbing and electrical work detailed analysis is given of the work involved and the techniques employed. There are many points of detail on which time is saved over traditional methods; for instance, the use of a ramset gun is quoted for fixing a meter board instead of hand-drilling. This, of course, is now used to a small extent in this country, but its use could well be extended.

It is also interesting to note that in plastering three-coat work is generally asked for, whereas in this country the usual rule is only two coats.

However, it is in dealing with such matters as site organisation and methods of construction that we can learn most from this book. "Considerable savings are achieved by planning, scheduling and applying the evolved techniques of material handling and layout." Much of what is written was known only too well by the most successful pre-war speculative builders in this country, but to-day much appears to have been forgotten or neglected.

Items, which are quoted and are well worth our study, include the use of steel windows with metal linings. Among other savings is the fixing of ironmongery off the site— the use of such things as metal door jambs and doors with locks. Ironmongery already fixed is said to save two and a quarter hours on every door!

Again, the use of dry wall construction is shown as less expensive than wet wall construction. To take a typical example, the cost for a plaster-finished house was $875, whereas for a gypsum wallboard the cost was only $385.

In roof construction the book shows the advantages of truss construction. The various operations of putting up a normal pitched roof are contrasted with those for a trussed roof, and the saving is given as 30 per cent. on man-hours. It is interesting to see that they advocate trusses at 2 ft. spacing, thus avoiding purlins and rafters: standard practice here would have trusses at 6 ft. spacing with purlins and rafters.

In general terms this book must be classified as a complex text book. It is not very easy to read and lacks what is so essential in a good text book—a clear index. It is worthy of study by those who take a keen interest in the detailed studies of cost analysis and forms an interesting comparison with much that has been written in this country on this subject.

PETER B. KENYON.

BOOKS RECEIVED

ESTIMATING FOR BUILDINGS AND PUBLIC WORKS. 12th Ed. by the late B. Price Davies, FRICS, FRIBA. (Cardiff: Western Mail and Echo, Ltd.) Price 42s.

ITALY'S ARCHITECTURE TO-DAY. (London: Alec Tiranti, Ltd.) Price 63s.

SOUTHWARK STORY. By Florence Higham. (Hodder and Stoughton. Ltd.) Price 20s.

MATERIALS AND METHODS IN ARCHITECTURE. Edited by R. H. Holmes. (London: Chapman and Hall.) Price 80s.

MOTELS. By G. Baker and B. Funaro. (London: Chapman and Hall.) Price 96s.

ARCHITECTURALLY SPEAKING. By E. Raskin. (London: Chapman and Hall.) Price 28s.

SIMPLIFIED DESIGN OF STRUCTURAL STEEL. 2nd Ed. By H. Parker. (London: Chapman and Hall.) Price 46s.

T.V. STATIONS. By W. J. Duschinsky. (London: Chapman and Hall.) Price 96s.

∴ *Books reviewed in these columns may be obtained on application to the Book Dept., "The Builder," 4, Catherine-street, Aldwych, WC2. Cash (which should include 1s. to cover postage and packing) should accompany the order.*

LAW REPORT

Contractors' Huts on a Building Site Held to be Rateable

COURT OF APPEAL. BEFORE LORDS JUSTICES JENKINS AND ROMER AND THE MASTER OF THE ROLLS.

LONDON COUNTY COUNCIL *v.* LANDS TRIBUNAL

THE Court of Appeal held on March 30 that building contractors' huts on a building site are rateable. Two appeals by the London County Council against Lands Tribunal decisions allowing two sites to be added to valuation lists were accordingly dismissed, with costs. Leave to appeal to the House of Lords was given.

The sites were respectively Walker Street School Site, Stepney, and at Woodberry Down Estate, Stoke Newington, both owned by the LCC. The former was intended for the erection of a school and the latter for the building of an old people's home. While work was in progress the sites were occupied by huts belonging to the respective contractors and were used for storage and other purposes.

The LCC, appealing as owners of the land, argued that the Lands Tribunal was wrong in holding that the hereditament was capable of beneficial occupation, or that the occupation was sufficiently permanent to give rise to rateable occupation.

Giving judgment on the first appeal, Lord Justice Jenkins said that the structures concerned were temporary wooden buildings of the kind commonly found on sites while building operations were going on. In this case they had long been removed and the school had been completed. They were brought on the site about January, 1950, and were removed between June and September, 1951. Nevertheless, the question was one of some general importance to building owners and contractors, probably of more importance to the former because the contractors could pass on liability for rates as part of the cost of works.

His lordship described the structures as a wooden sectional hut 9 ft. by 12 ft. 9 in. used as a foremen's and timekeepers' office (gross value £4); a cement store on a cement floor and partly of corrugated iron—9 ft. by 14 ft. (gross value £5); canteen and store —14 ft. 10 in. by 30 ft. (gross value £17); and a plumbers' store— 8 ft. by 12 ft. (gross value £3). The total gross value was accordingly £29 and the net rateable value £20.

The contract provided that the architect had various rights of entry and access to the contractors' huts and the LCC reserved the right to occupy the site for its own purpose whether work was in progress or not. The specification attached to the contract allowed the contractors to use the site for storage and other purposes, and the contractors had to provide sheds and messrooms necessary for the proper execution of their works. There was also a provision for the contract to be completed in 12 months.

FOUR PREREQUISITES

The court had to decide on those facts, continued Lord Justice Jenkins, whether the four temporary structures were in rateable occupation. Four prerequisites of such occupation, as approved by the Court of Appeal, were: (1) There must be possession

by the alleged occupiers; (2) possession must be exclusive for the particular purposes of the occupier; (3) possession must be of some use, value or benefit to the possessor; (4) possession must not be for too transient a period.

The valuation authority submitted that those four conditions had been satisfied, but the LCC maintained that the use of the structures did not amount to rateable occupation because of its special and transient character. They said that the contractors' occupation was not exclusive and that they were mere licensees of building owners, the structures being mere episodes in the carrying out of the contract. They also said that the structures, being temporary, could not be part of the hereditament so as to make occupation rateable.

Lord Justice Jenkins held that the four prerequisites for rateable occupation had all been satisfied. As to exclusive possession, the rights of the LCC, the architect and the LCC's clerk of works were less substantial than those which the Court of Appeal had already held not to affect exclusive occupation. The period of occupation also was of sufficient degree of permanence.

Discussing the contention that the huts were chattels and not part of the hereditament, his lordship said it would appear that the huts stood on the ground by their own weight without any physical attachment to the soil. That was not, however, conclusive that the huts retained their character as chattels. They were not independent chattels in the sense that they could be brought on the site in the condition in which they were erected. The parts of the huts ceased to be chattels when they were assembled and they became part of the hereditament for rating purposes as long as they stood on the site. He would dismiss the appeal.

The Master of the Rolls and Lord Justice Romer agreed, and both appeals were accordingly dismissed.

LABOUR SHORTAGE

Apprenticeship Schemes Urged

AT A MEETING of the Wolverhampton Town Council on March 28, COUNCILLOR MRS. E. V. FLETCHER said that she thought the building industry could show more enterprise in trying to attract and direct suitable young people into the trade and so help to solve the acute labour shortage.

In January, 1955, it was stated, there were only 215 registered apprentices in Wolverhampton and Mrs. Fletcher said that she had been told that double that number could be absorbed. Of the 200 large or small building firms in the area, including jobbing builders, only 90 were members of the building trade employers' organisation and applied apprenticeship schemes.

"However bad the supply of materials, there is no doubt that finding skilled workers to-day is more difficult," she said, and added that it was time the housing industry "pulled its socks up."

WORLD POWER CONFERENCE

The fifth Plenary World Power Conference is to be held at Vienna from June 17 to 23, 1956. Details from the Secretary, British National Committee, World Power Conference, 201-2, Grand Buildings, Trafalgar-square, WC2.

BUILDERS' BENEVOLENT INSTITUTION

Annual Dinner

THE Builders' Benevolent Institution is to widen its scope so that it can offer assistance to a greater number of those members of the industry who are in need of help. This decision was announced by LT.-COL. W. W. DOVE, CBE, FSA, this year's president of the BBI, at the Institution's annual dinner held at the Dorchester Hotel, London, on March 29.

Lt.-Col. Dove said that the institution, in the 108 years of its existence, had performed a very great duty to the industry by the assistance it had given to master builders and their dependants who had fallen upon bad times. In spite of the Welfare State in which we lived to-day, there were still many members of the industry in need of assistance and the Institution was planning to increase the number of its beneficiaries.

He announced that up to date his appeal for contributions had raised £1,626 and the fund would remain open until next January.

In proposing the toast of the "BBI" (to which Lt.-Col. Dove responded), MR. J. R. BEVINS, Parliamentary Secretary, Ministry of Works, first praised the benevolent work of the Institution and went on to refer to the praiseworthy efforts of the industry generally and, more especially, to the achievements of the building materials producers. He forecast that the future was set fair for builders and gave an assurance that his Department would assist in keeping the industry fully occupied.

MR. L. J. HOLLOWAY, president LMBA, proposed the toast of "The Guests" and extended a particular welcome to the Masters of the Worshipful Companies of Tylers and Bricklayers, Plaisterers, Plumbers and Painter Stainers. He said that the City companies provided a lead to the industry in matters of training and education.

MR. HARVEY G. FROST, OBE, president NFBTE, replied for the guests.

"CAREERS IN BUILDING"

National Federation's New Publication

PRINTED in two colours and well illustrated, the NFBTE's most recent publication, "Careers in Building," is now being circulated to youth employment officers, schools' careers masters and Regional Federations.

The aim of the Federation's education and training committee in preparing the booklet has been to provide those whose responsibility it is to guide young people into the various branches of industry with a broad outline of the openings for young men in the building industry, how they may be found and how technical training may be obtained. The text is divided into four main sections: The Building Industry, The Men of the Building Industry, The Building Crafts and Training for Management. A list of Employers' Regional Secretaries is appended.

The first section describes the varied nature of building operations and emphasises the industry's need to maintain its force of skilled men at all levels in order to carry out the vast programme of work which, as the National president said in one of his recent speeches, "stretches far into the future."

The title of the second section—The Men of the Building Industry—is self-explanatory. Stress is laid on the fact that technical training is necessary not only for those engaged in the building crafts but also for those on a contractor's headquarters staff—the departmental managers, buyers, estimators, plant engineers and so on.

The fact that building is one of the few industries to-day in which it is possible to start on the first rung of the ladder as a craft apprentice and rise to the very top is made clear at the beginning of the section on The Building Crafts. The National Joint Apprenticeship Scheme is summarised and mention is made of the qualifications and awards for apprentices, pay and conditions, promotion prospects and the way to go about becoming an apprentice.

The two main methods of approach to managerial positions in the building industry—the one through craft apprenticeship, the other (more applicable to those attending a grammar or public school) through articled pupilship—are described in the section dealing with Training for Management. An accompanying chart indicates in a general way the various rungs of the promotion ladder which may be scaled by properly trained personnel. The appropriate qualifications are described, together with some observations on how to commence training for building management.

THE WALLBOARD TRADE

WIDMA Dinner

THE annual dinner of the Wallboard Importers', Distributors' and Merchants' Association of the UK was held at Grosvenor House, London, on March 29. MR. LESLIE H. STOREY, president, was in the chair.

Proposing the toast of "Our Guests" Mr. Storey said that for the second time since the war they had attained freedom of import and congratulated the vice-president and his negotiating committee on the success of their efforts. He said that he had in October last appealed to the trade to meet this situation with a due sense of responsibility, not only to the trade but to the nation as a whole. He could say that the national interest had in no way been impaired but did not visualise in October that it would now be necessary to issue a reminder that the sense of responsibility for which he had appealed was to trade as well as to nation. He did not think it was in the consumers' interest to buy at uneconomic figures.

The president went on to say that although their trade was still young and lively and composed of people who tended to be individualists, nevertheless, he hoped that they would give their mutual interests time to develop, and if they did he was sure that federation would come to fruition in the natural sequence of events.

THE NORWEGIAN AMBASSADOR, M. PER PREBEN PREBENSON, GCVO, CBE, in his reply to Mr. Storey expressed his satisfaction (as the representative of one of the countries which belonged to the largest group of wallboard exporters), in the progress that had been made in the sale and use of wallboard. He added that it was impressive to note that in 1954 imports of wallboard were 100 per cent. higher than in the previous year. The toast of "The Chairman" was proposed by MR. KENNETH A. N. ROBERTS, hon. treasurer.

TOWN PLANNING DECISIONS

Scaffolding Firm Wins Appeal for Extension of Depot

AN appeal by Scaffolding (Great Britain) Ltd. against the failure of the Meriden RDC, acting on behalf of the Warwickshire CC, to issue decisions on planning applications relating to the company's Bickenhill depot has now been considered by the Minister of Housing and Local Government, following a local inquiry.

The depot is on the north side of the Birmingham-Coventry trunk road (A45) approximately 1½ miles east of the Birmingham City boundary. It occupies a site of 2.9 acres on which there is a number of single-storeyed buildings constructed of corrugated iron or asbestos sheeting on tubular steel framing. Some are enclosed and others are open on one or more sides. The site is used for the storage, issuing, repair and maintenance of tubular steel scaffolding, and for wood and metal shuttering required in connection with building and other ancillary work. The area surrounding the depot is essentially rural in character, although there are a few houses and a public house on the other side of the trunk road.

The appellants now want to erect within the curtilage of their existing buildings additional single-storeyed buildings for use for industrial storage. This would involve an increase in floor space from approximately 56,000 sq. ft. to 67,850 sq. ft. They also wish to use their Welding Shop No. 2 for press work, for which purpose they propose to install two electrically-operated presses. It was stated on their behalf at the inquiry that the depot was established at Bickenhill during the war after their depot in Birmingham was made unusable by bombing. Welding Shop No. 2 was used for the production of telecentres and shuttering plates, etc., which, the appellants contended, did not involve the establishment of a new industry, but was an integral part of their business of preparing, renting and maintaining scaffolding and shuttering. They failed to see what was the objection to the proposed building extension, as it would occupy a yard completely surrounded by other buildings, would not be seen from outside the works, and would give no offence to anybody.

The Council said they would have to accept that the use of the site for the storage and repair of scaffolding was a long-established use, and must be regarded as complying with planning control, but they did not agree that the present proposal involved no change of use. They said they had no intention to secure the removal of the existing buildings, but they were anxious to prevent any enlargement of the depot in view of its situation in the remaining narrow belt of country between Birmingham and Coventry. Permission had already been refused for two large-scale housing projects in this area, and in both instances the Minister had dismissed the ensuing appeals.

In the course of his decision the Minister states that he has carefully considered the facts of the case. He notes that the new extension buildings would be within the existing curtilage of the depot and would not be visible from outside. Although he appreciates that the extension might result in some increase in the volume of the business, he has come to the conclusion that neither this nor the use of the presses in Welding Shop No. 2 would be likely to have any material effect on the character of the undertaking as a whole or on the green belt between Birmingham and Coventry. In the circumstances, the Minister considers that there would be no objection to the appellants' proposal and he accordingly permits the erection of the extension buildings and the use of the Welding Shop No. 2 for press work.

The Minister notes that the appellants' application form was accompanied by a letter asking for determinations under Section 17 of the Act as to whether machines could be installed in Welding Shop No. 2 and a lesser extension of the premises carried out without the necessity for applications for planning permission. The Minister understands that these requests for Section 17 determinations were submitted as alternatives to the main application for permission to extend the existing floor space by 11,850 sq. ft. and to use Welding Shop No. 2 for press work. In view of his decision to permit the proposed development, it appears that no useful purpose would be served by determinations under Section 17, and he does not, therefore, propose to take any further action in this connection.

Proposal for Self-Service Hotel

AN appeal by Mr. C. K. Gammon-Hardaway against the refusal of the Hampshire County Council to permit the erection of a self-service hotel on land adjoining "Sea Shells," Southwood-road, Hayling Island, has been considered by the Minister of Housing and Local Government following a public inquiry.

Permission was refused by the council on the grounds that the number of housing units proposed was too high and that at times of maximum occupation the site would be unduly congested; that the type of development proposed could only be satisfactory if each unit were self-contained in respect of lavatory and sink accommodation, with bathing facilities either self-contained or available internally within the main structure, and also because accommodation should be provided on the site for a caretaker.

The appeal site is a small plot of land adjoining a guest house known as "Sea Shells" and, with the exception of a wooden lavatory structure, is vacant land.

On behalf of the appellant it was stated that the proposed self-service hotel would provide self-contained furnished accommodation for 14 families in an attractive form and each unit would include a sink and washing facilities. A new lavatory block would be constructed, whilst baths and showers would be incorporated in the main structure. These latter would be communal as in a conventional type of hotel. The self-service hotel was intended for holiday use in the summer months only and would be a satisfactory alternative to ordinary chalet or caravan development. A caretaker was permanently available at the adjoining guest house.

For the council it was stated that they did not object in principle to the proposal, but they considered that the density of persons per acre would be too high, and they were not satisfied with the sanitary arrangements proposed. A plan was submitted which had been prepared in the county planning department, to indicate how these objections could be resolved. The council's scheme reduced the number of units from 14 to 10, all of which would overlook the sea and provide separate sanitary facilities for the sexes with covered accesses. This scheme was not acceptable to the appellant as it was more expensive.

In the course of his decision the Minister states that the appellant proposed originally to construct a building which would provide 15 living units. In an effort to meet the council, a modified plan was drawn up to reduce the total number of living units to 14 and provide baths and showers within the main structure with additional lavatory facilities outside. The Minister sees no objection to these proposals provided the lavatory block is joined to the main building by a covered way and the ground-floor overhang extended to provide a covered walk around all sides of the building.

The Minister has accordingly decided to allow the appeal, and he hereby permits the erection of a self-service hotel on the land in question in accordance with the modified plans on condition that a covered way between the main building and the lavatory block shall be provided and the ground-floor overhang extended as may be agreed with the local planning authority or, in default of agreement, as shall be determined by the Minister.

New Shop Front Allowed

IN view of the variety which exists in the appearances of a number of shops forming a continuous block at High-street, Welling, the Minister of Housing and Local Government has allowed an appeal by Mr. A. F. Bull against the refusal of Bexley Council, acting on behalf of the Kent County Council, to permit the erection of a new shop front at 59, High-street.

The appellant claimed that his shop, which was one of a block of 16, was left in a corner because of the fact that both adjoining shops stood forward. No. 59 was the first of the middle six shops, which were recessed behind the outer shops of the block. His business, he said, was being badly handicapped by being hidden in the corner, and he wished to provide a new shop front flush with the face of the upper storeys, which projected 2 ft. 7 in.

The council contended that at the moment there was a balanced composition of the whole block of 16 shops, and the proposed new shop front was regarded by them as an asymmetrical irregularity out of keeping with the original intention in the design.

HOUSING PROGRESS REPORT

Figures for February

THE HOUSING SUMMARY presented to Parliament as a White Paper* jointly by the Minister of Housing and Local Governments and the Secretary of State for Scotland, shows that the number of permanent houses completed in Great Britain during February was 23,345 compared with 19,786 in February, 1954.

In the first two months of 1955, 44,312 permanent houses were completed compared with 44,381 in the same period of 1954.

* Cmd. 9424 Housing Summary, February 28, 1955. HMSO, price 2d.

COSTS: THE CHALLENGE TO THE HOUSE-BUILDING INDUSTRY

By L. V. MERLIN

IT has been stated that unless the cost of house-building is substantially reduced, the building industry will price itself out of existence.

The building trade is unique, in so far as it is not directly subjected to the fierce competition of the export market, but operates in a comfortable vacuum of its own. It also operates as a protected industry since a subsidy is required to bring its products within the reach of the average wage earner, despite the fact that the vendors are a non-profit-making organisation. Even so, the rents demanded are sometimes beyond the scope of the would-be tenant. Already these subsidies have been reduced and perhaps this is the writing on the wall. All this tends to widen the gap between the unrealistic rents now charged by local authorities and the rent any speculative investor would need to impose to secure an economic return for his outlay.

If local authorities ceased to operate as the industry's largest customer and the subsidies were withdrawn, how many people would then be able to afford the increased rent? The only customers left would be those comparatively select few who could afford to purchase or pay the rent demanded. This would hit the larger organisations more than it would the smaller, so this article is mainly directed to the former.

"A FOOL'S PARADISE"

The building industry, therefore, appears to be working in a fool's paradise, and its future existence depends on its ability to build more cheaply. It must be done and it can be done. The extraordinary variation from site to site in the number of man-hours expended in building what are virtually standard houses provides a fair indication of the overall economy that is possible, and is also a measure of the industry's inefficiency. It has been said that the largest store of energy which this country possesses is the energy it wastes. Every honest person, concerned with the well-being of the building industry, will have to admit that this is a home truth.

If as much thought and detailed planning were given to house building as is normally given to the running of any medium-sized factory, the results would be astounding. The conventional reply to this statement is that you cannot compare a building site with a factory, the inference apparently being that the running of a factory is like shelling peas. If it is so, it is a tribute to the first-class organisation responsible for this desirable state of affairs.

The point at issue is that, while everyone agrees that the job of building houses is more difficult to control than the running of a factory, very few, if any, firms can boast of an organisation as efficient

Our greatest need is for a man with the mentality and genius of Henry Ford who would approach this problem with a mind unhampered by the worn-out fetishes of the past. Then, and only then, will inspired methods replace the present slap-happy chaos.

Since criticism is negative unless it is also constructive, some of the ways in which the cost of building could be substantially reduced are suggested below. It is only possible, within the scope of this article, to generalise, but it is hoped that the points raised will at least provoke further thought on the matter, which in the course of time may be translated into action.

"THE DEADWOOD OF CUSTOMARY PROCEDURE"

The following quotation is taken from the Amalgamated Engineering Union's monthly journal of March, 1943: "The foremost requirement to get deep into our consciousness is the primary importance of saving time . . . It is *not* a speeding up or a further forcing of the pace, but a discovery of where precious time skulks beneath the deadwood of customary procedure. . . ." The sting, of course, is in the tail! Take any typical building operation and note how long it takes. Time it from the completion of the *previous* job and continue until yet *another* job is started. Then abstract the effective working time spent in the actual accomplishment of the task in question and express it as a percentage of the overall time. Then call for a large whisky and soda; you will need it!

Every job can be broken down into "main time" and "supplementary time." The first represents that portion in which actual progress is made in the completion of the job, and the second portion is composed of necessary or unnecessary operations which only indirectly affect the progress of the job. These latter can include waiting for material, instructions or assistance, idle gossip, and a host of other parasitical occurrences. This experiment is guaranteed to shake any self-satisfied builder out of his complacency. In the majority of factories the manufacture of any large component is broken down into individual units which come together as sub-assemblies until they unite to form the component.

The act of breaking down an operation into multiple elements is equivalent to looking at a small-scale map with a powerful magnifying glass—the details attain a new significance.

Inefficiences are soon rooted out and time losses easily detected. The other lesson to be learned from factory organisation is to plan right down to the smallest detail. As an example of what is meant by attention to detail, how many agents pay heed to the weather forecast (ever seen a barometer on a building site?) and prepare an alternative work schedule where possible, ready to put into immediate operation when "rain stops play?"

SUB-DIVIDING THE TASKS

Through the processes of natural selection and the decrees of custom, the multiple operations involved in building a house fall into a limited number of trade divisions, but this process does not go far enough. They need to be further broken down into single repetitive tasks that are complete in themselves.

The sizes of these tasks will depend on the gang-hours involved so that a perfect balance is struck between trades. Wherever practicable each gang should be assigned two of these tasks so that if they are held up on one, or become out of step with other trades, they are able to switch over. Once a gang has been assigned to these tasks they will do nothing else but work steadily through in one uninterrupted sequence until the contract is completed. Thus, each man will know exactly what he has to do and in the process become a specialist in his own particular sphere. Moreover, even a labourer can be quickly trained to undertake a single repetitive task so that eventually there should be no shortage of tradesmen.

Application of the Method

EXCAVATION

Before a single item of material is sent to the site, a scraper should be available to strip over sites and excavate to reduce levels, etc., spreading the surplus soil where possible, so that the expense of carting it away is kept to the absolute minimum. The site should have been properly surveyed and possible "fill areas" clearly indicated by pegs. Material has been carted away from sites where the ground at the back of the house slopes away, thus providing a potential fill area. Next, the foundation trenches should be excavated by machine, preferably the multi-bucket type ditcher, which will continue in one uninterrupted sequence until the whole site is completed. The foundation plans should be kept as simple and free from off-shoots as possible to suit machine excavation. It should also be remembered that the principal requirement of a plan or drawing is legibility. Closely following will be one or two men bottoming up, which in the case of the ditcher merely means "cleaning up." They will also deal with shallow excavations required for chimney breasts, etc., and a setting-out jig for these additions should be provided to define quickly and positively their area and position.

CONCRETING

It is obviously important, especially in wet weather, that the trenches be concreted with the minimum of delay, and accordingly one or more gangs will follow closely on the heels of the machine, doing nothing else but concreting to foundation trenches. They will, in time, be followed by the bricklaying gang who will erect the footings up to DPC. Although it was necessary for the first gang to keep up with the machine it is not so vital that the second gang should keep pace with the first. Next come the gang handling the hardcore, and finally the concreting gang for the over-sites and outhouses, etc. It may be expedient for the first gang, on completion of their task, to reconstitute themselves into an additional over-site gang so that their output is intensified and the mixer put off hire at an earlier date. This will depend in some measure on the relative volumes of concreting involved. It may even be necessary to put all the available gangs on

concreting the foundation trenches first.

At least two mixers will be necessary, operating as a semi-central set-up, and their individual capacity should be not less than half a cubic yard, or as large as the mix proportions will allow without splitting a bag of cement. They should be used in conjunction with half-yard dumpers.

The set-up should be arranged so that the dumpers can run both sides of the mixer, i.e., in opposite directions, so that the number of occasions when it becomes necessary to shift the set-up is halved. This should only be done when calculations show that the dumper haul becomes uneconomic, but account should also be taken of the gang-time expended in making this move, plus the loss of unreclaimed ballast which occurs each time it takes place.

On many sites the concreting is done with a 10/7 mixer served by barrowers, so the set-up has frequently to be shifted and the time lost, together with the unsalvaged ballast, is unnecessarily wasteful and costly. The successive stations of the mixer set-up should be determined beforehand and clearly indicated. Given sufficient forethought, it should be possible to determine both the quantity of ballast required and just exactly where it has to be tipped ahead, so that the work is not held up through shortage of ballast, or even while it is being tipped, a common enough occurrence. When the last over-site has been completed the larger capacity mixers, with most of the dumpers, will be sent off the site and replaced by a smaller mixer.

The roads will now be clear of the mixer set-up and of heaps of ballast and cement stacks and other paraphernalia cluttering up the site, while the number of men requiring supervision will be reduced.

While on the subject of concreting, all lintols, door-steps, etc., should be precast on the site in stout metal moulds, not wooden forms nailed together. The same remarks apply to shuttering for the front porch, hearths, steps, drain surrounds and other similar repetitive jobs. This completes Phase 1.

BRICKLAYING

Assuming a gang of eight bricklayers, only two need to be tradesmen, the remainder could be trainees. The bricklayers would build the corners and breast walls and front elevation, if facing bricks are called for. The trainees would be detailed to specific operations such as internal sleeper walls, gable ends, rear and internal walls, etc. However the work was split up, it would represent a portion of the shell complete in itself. To interchange the tasks between the trainees would ensure all-round efficiency. When the first gang had completed, say, six houses up to first-floor level, the scaffolders would take over. Then a second gang would complete the bricklaying up to eaves level while the first gang started another six houses.

A full-sized setting-out jig in light alloy should be used in conjunction with plumbed profiles.

CARPENTRY AND JOINERY

A special covered compound with a power saw for precutting all timbers, is a necessity. The chargehand should be provided with a detailed cutting schedule and metal templates for all the joints in use with jigs for cutting to length. Even such items as floorboards, skirtings and architraves should be cut within an inch or two of their finished length. Each room should have its own identification colour and the cutting templates and jigs coloured accordingly. When the timbers have been precut they should be stacked in sets ready for issue and the appropriate colour strip painted on each unit. Notches and cut-outs for pipe runs, conduit, etc., should be made *before* the timber is in position. The spacing and position of all floor joists and roofing timbers should be positively controlled by light metal templates suitably notched.

The ideal at which to aim is to arrange matters so that the tradesman can dispense with his rule. In accordance with the principle laid down, a special gang should be employed to fit and fix all doors and they should be supplied with an electric hand planer and power hand saw.

The manually operated tools of the carpenter should be regarded as an expensive luxury. All doors should be fitted in the factory with lift-off hinges and with the mortice cut for the lock if required, together with a hole drilled for the door handle. These operations could be done in a jig much more cheaply at the factory. They should also be delivered knotted and primed, except for the front edge of the door. Once they have been properly fitted they should be lifted off their hinges, marked, and taken to the paint shop where painting should be finished without delay, locks and handles fitted and retained until the house is completed.

PAINTING

Adjacent to the timber compound should be the paint-spraying compound where all timber requiring painting should be sprayed up to at least the priming coat, and this should include soffit and fascia boards.

The painter should not appear on the scene until the other trades have left, and the principle of one man one colour should be adhered to as far as possible. The familiar sight of a painter applying the finishing coat while a labourer sweeps up the room is typical of the chaotic conditions that usually prevail.

The plasterer labourer, or the general labourer, should be made to clean all windows and surrounding woodwork before the material has set. The usual practice is to leave it to the poor old painter who has to spend needless hours with sandpaper and stripping knife removing material that could have been wiped off with a rag in a fraction of the time. In fact, all trades should be made to clean up before they leave, if other trades will be affected. If a man has to clean up his own mess he will make sure the work is kept to the absolute minimum.

STOREKEEPING

For some obscure reason it is generally considered that the stores can be entrusted to any Tom, Dick or Harry, with a complete disregard as to his suitability or otherwise.

The storekeeper has it in his power to hold up quite a number of people through one cause or another, and his importance should not be underrated. He should be provided with a comprehensive and detailed material schedule and a first-class stores record system.

All ironmongery should be in suitable containers packed in sets or house lots ready for issue.

Incoming goods should be stacked in related groups with due regard to their probable order of issue. Tradesmen should not have to wait while the material is sorted out; it should be ready for them in advance. A printed slip should be included so that the issue may be easily checked. The stores should not become a meeting place for garrulous time-wasters.

PRE-LOADING

In addition to the materials arriving on the site in the correct sequence and at the right time, they should also be unloaded in the position and quantity in which they will be used. This should be the exclusive responsibility of a pre-loading gang who should be furnished with a detailed plan giving all this information.

Whenever material has to be handled more than once, the reasons should be critically examined to see if any of them can be eliminated.

Handling material adds nothing to its value—only to its cost. A materials movement chart, on which the path of all materials is indicated by lines, can be extremely revealing. Staircases, cupboards, baths, etc., should be unloaded directly into the house where they belong, but for this to be done the method of supply would need to be better organised than it usually is.

JIGS AND TEMPLATES

To permit the full use of prefabricated components, baths, lavatory basins, wc pans, sinks and other similar fitments should be positioned with the aid of a jig or template so that in every house of similar type the position of these components would be identical.

The position of the first-floor door frames and internal walls is usually established through the medium of a folding rule and pencil marks on the floor. It is not surprising, therefore, to find that no two houses are the same, and on occasions, for example, there has been scarcely enough room to make the plumbing connections to the bathroom taps. All houses should be designed to a module or common fixed unit of measurement and there is some indication that this desirable aim is receiving attention. If it is achieved, then, presumably, it will be possible to fit plaster boards to the ceilings without cutting, or perhaps "ripping" would be a better word. And why should it be necessary to cut and screw gas-barrel on the site? —a time-wasting procedure involving lengthy perambulations from inside the house to the vice-stand outside and back again. Sometimes the component itself could be designed to function as a gauge; for instance, the wall tie used for cavity walls.

LOST TIME

On no account should men leave their place of work for the tea break; the tea should be delivered to a central point or points by the canteen staff and then collected by one labourer from each section. It would probably pay to present each man with a thermos flask. The catering

service should also be first class, so that meals are served promptly and the men satisfied. At the end of the allotted time for the lunch break the canteen should be cleared and locked. Probably more time is wasted in this department by outsiders than anywhere else; it therefore needs to be controlled by rigid discipline.

In the winter months the last half-hour is usually a write-off, and it should be possible to wire up the houses and connect to the main much earlier than is usually possible.

THE GANG

It is important that the gang work together as a team, since one discordant element can completely disrupt its smooth working. Relationship charts are available, and are used to determine how various temperaments can be combined to the best advantage of all concerned. It may be a counsel of perfection to suggest that they should be applied to building labour, and the idea will probably raise a laugh. Let it be understood, however, that not nearly enough thought is given to this matter and this is reflected in the overall output. Once a satisfactory gang has been formed every effort should be made to keep it together.

THE PROGRESS CHASER

In every factory there is a progress chaser whose job it is to see that the work is completed on time. He also ensures that the material is available and that each unit is completed in step with the whole.

He irons out all the difficulties, relieves the hold-ups and generally co-ordinates the activities of all departments. His counterpart in the building trade would be invaluable.

He would, amongst other things, draw all the material for the different trades so that no unnecessary time was lost between the finish of one job and the start of another. In conjunction with a properly balanced programme he would ensure that the work was proceeding in step and advise ahead of possible hold-ups.

CONCLUSION

It has been said that the proper application of what is already known would be more beneficial to industry than any new discovery that is at all likely to be made.

Articles have appeared in *The Builder* dealing with site layout, prefabrication, mechanisation, standardisation, grouping of services, one-pipe soil and waste systems, and a host of other cost-saving suggestions not specifically referred to in this article. The author himself has contributed to an article on site wastage.

A determined effort must be made to gather up all the loose ends and create some semblance of order in the trade. Everything must be considered down to the smallest detail. If the building site could be run more on the lines of a factory and less on the lines of a holiday camp, the cost of houses would come down with a bump and the worker would benefit as much as the employer. It would mean a major revolution, but, as a Minister of Housing has rightly said, "Difficulties are a spur to ingenuity, not an excuse for inaction." Who will take up the challenge?

STAINED GLASS

The Art and its Problems

A PAPER entitled "The Beauty of Stained Glass," by MR. CARL EDWARDS, was read to the Royal Society of Arts on March 9. Lord Mottistone, FSA, FRIBA, DL, was in the chair. Extracts from the paper are given below:

Although stained glass was thought to be a lost art it has been rediscovered since the revival of the nineteenth century, but the process has been slow. It is a fact that the materials and colours of to-day are as pure and rich as ever they were. Much research has been made in the manufacture of glass. Very little has been said, however, about the relation of stained glass to architecture. Very rarely does a text-book show a window in its proper setting. Too often people confuse stained glass with picture painting. They will discuss a panel of glass in an exhibition on the merits of the techniques employed, on the type of draughtsmanship and other abstract qualities which may please them. They do not always appear to be aware that all these qualities are but a means to an end. That the panels of glass would look entirely different in a building such as a church does not occur to them.

A picture painter may paint in any manner he pleases whatever subject may interest him personally. How different it is for a stained-glass artist, or for that matter, a mural painter or sculptor who works on the fabric of a church. The setting is there. It cannot be altered. The technique applied to the work must be adapted to the height or position which it is to occupy. He may find that his window receives so little light that he may not even be able to use colour at all. His window, however, especially if he is well grounded in his craft, can still be made to be very interesting.

EFFECTS OF LIGHT

In order to understand stained glass one must consider it in connection with light. A coloured glass window will appear to be quite different in key in the afternoon light and in twilight: the intensity of colour in glass varies according to the power of light behind it. Not only do the colours vary in intensity according to the light but they also spread beyond their actual areas and affect other colours.

Because colours radiate one into another the effect, unless carefully considered, can in some cases be most unpleasant. On the other hand, the fact that colours do affect one another is not always a disadvantage, and a designer will learn from experience that by placing various colours in close proximity to one another it is possible to obtain something that is very beautiful. There can, however, be no firm rules on the use of particular colours, because so much depends on types of glass used, the position of the window and the artist's methods.

Everyone agrees that much is to be learnt from the medieval glass. On the other hand, perhaps because of my nature, I am suspicious of old glass. How much of it is new and how much of it is old? That glass remains beautiful however old it is seems to be true. A wonderful quality is given to glass by age because the surface wears and becomes pitted with small holes. The moisture in the atmosphere attacks the alkaline silicates in the glass, leaving the silicate behind and a patina is formed so that the light is retained within the window and sets up a wonderful radiance.

We also know, however, that some colours that were in the early windows have not lasted the passage of time. Green, I believe, is particularly vulnerable. Yellows, browns, purples and whites are also very susceptible to age and decay. Windows have to be re-leaded from time to time in order to preserve them; small pieces of glass that get badly damaged are replaced here and there. Many old windows, in England at least, were neglected, and they suffered by this every bit as much as they did at the hands of the iconoclasts.

The second reason is that the atmosphere, particularly in the towns of England, is corrosive even to glass. The matter in the air will soon place a film of dirt on the window. Dirt in the atmosphere has caused many designers to consider their techniques very carefully. But stained-glass windows have been made which overcome these difficulties very successfully.

HANDMADE GLASS

An "uninteresting" glass, from the designers' point of view, is one that is very flat and uniform in manufacture. Therefore most of the glass used in the better type of stained-glass window is made by hand, with the result that no two pieces in a window will be of exactly the same character.

There are four different types of hand-manufactured glass in use: (1) Moulded glass: which is obtained by pouring molten glass into a mould. (2) Muff or Antique glass: which is a blown glass formed into a cylinder first and then cut down one side and spread flat in a heated oven. (3) Crown or Spun glass: also a blown glass, but is formed into a flat circular shape by spinning it. (4) Slab glass: obtained by blowing glass into a box-shaped mould. The sides and bottom are cut away, each piece forming a slab. The first three methods have been used for centuries, but the last method was conceived at the end of the nineteenth century.

Each type of glass is very different from the other in character and light radiation alters accordingly. The early medieval people used at last two types, spun and muff glass, and to-day a craftsman knows that if he uses more than one sort of glass he begins with a window that has life. It has interesting light because of the differences of radiation. This interest can be increased by using different thicknesses of glass and also by using glass that has imperfections such as small bubbles with it and surface textures. By this means the light is contained in the glass instead of going directly through it, and if the materials used in the manufacture of glass, such as sand, etc., are of a high quality, the glass can appear to be very bright indeed.

ACCIDENTS IN FACTORIES

Responsibilities of Contractor and Occupier

THE division of responsibilities between the contractor and the occupier for any accident which occurs in a factory was discussed by MR. A. G. PALMER, BSc, AMIGE, in a paper on "The Relationship Between Contractor and Occupier" given at the 20th meeting of the London Building and Engineering Contractors Accident Prevention Group held recently in London. Extracts from the paper and the discussion which followed are given below:—

First, it must be stated that the Factories Acts 1937 and 1948 place on the occupier of the factory in question the responsibility for securing observance of the Acts. This is clearly indicated in Section 130(1) of the Factories Act, 1937, and Section 130(5) extends this responsibility to specific officials of a company if the offence is committed with their consent or connivance.

The next and more difficult point is the position of the contractor. The presence of a contractor or sub-contractor is recognised in Section 64(3) which lays on the employer of any workman injured in a factory the duty of reporting the accident to the occupier of the factory. It will thus be seen that this section still makes the occupier responsible for reporting to the Factory Inspector accidents which happen to a contractor's employee but has provided him with the means of knowing that an accident has occurred.

It would therefore appear that the occupier will be responsible for the fulfilment of the Factories Acts within his own factory even when a contractor is carrying out the work in question. Contractors carrying out work either of a building operation or of works of engineering construction will only have applied to them those sections of the Act which are enumerated in Sections 107 and 108. There are probably general responsibilities between the contractor and the occupier for such sections.

DANGEROUS TRADES

Where dangerous trade regulations have applied, as for instance in building operations, the contractor will remain responsible for fulfilling these regulations. In addition, it may well be said that where those regulations are fulfilled they will establish a satisfactory standard for the appropriate sections of the main Acts. Equally well, a default on any of the building regulations may well also be a default of the appropriate section of the Factories Acts.

Although the above is true in many cases, there may be conditions in which the place where the work is being carried out by contractors can be considered either as a separate factory, a separate part of the original factory, or in itself not a factory. Such place must fall within the definition given in Section 151(6).

Fortunately, the factory department use commonsense in indicating prosecutions under the Factories Acts and the allied regulations. It has never been their practice to prosecute the occupier when the real culprit is a contractor or sub-contractor. This is not the position when a claim for damages is being made, and although as safety officers we are not concerned with the settlement of damage claims, it is advisable to know the basis of these claims.

A claim for damages is based upon the negligence of an employer or some other person who owes a duty to the injured person. The duties which may be owed to a workman are many and varied and do not really concern us. It is therefore necessary for the injured person to establish negligence in some form or another or a breach of statute which has been desiged to protect a workman from a danger. It may be that the injured person has a claim both against his employer and against the occupier of the factory. Each particular case must be examined on its own merits and no general guidance can be given.

There is, in addition, the possibility of a claim being based upon the common rights of the individual. Thus, he may maintain that the system of work was unsafe or that the plant or equipment with which he had worked was unsuitable. Such claims as these will almost always be directed against his employer, and are not likely to be applied to the occupier unless the occupier has undertaken the task of supplying the necessary equipment or controlling the manner in which the work is carried out.

CONTRACTOR'S RESPONSIBILITY

It is obviously advisable for the occupier to take a considerable interest in the way in which a contractor carries out the work whilst on the occupier's premises. This, however, must be done in such a manner that the occupier does not relieve the contractor of his full responsibility in performing the work in accordance with the Act or of any dangerous trade regulations which apply. In order that this condition shall be made perfectly clear it seems logical that it should be dealt with at the time of making the contract for carrying out the necessary work, and it would appear necessary therefore that the contract should include a clause making the contractor solely responsible for fulfilling all the requirements both of the Factories Act and of the dangerous trade regulations which may apply to that work.

Secondly, a clause should be included giving the occupier the right of inspecting the work to see that it is being carried out in a satisfactory manner, but at the same time indicating that this in no way relieves the contractor of his full responsibility.

These two clauses would appear to give the contractor a full responsibility for securing observance of the Act and dangerous trade regulations on work which he is carrying out irrespective of whether these requirements apply to him or to the occupier.

Lastly, there is need to see that if a contractor does default, the cause of his default will not become the responsibility of the occupier. Each contract should include an indemnity clause making the contractor fully responsible for any injury suffered by his workmen whilst carrying out work. The only exception to this should be where the injury is caused by the occupier or occupier's employee's negligence. Thus, although the occupier cannot relieve himself of his legal responsibilities under the Factories Acts, he can recover from the contractor under the terms of his contract any costs which may be involved in civil action.

Having made sure of the conditions of contract, then the contractor and his workmen should be subjected to inspection on the basis of fulfilment of contract. It is preferable to point out any breaches of statutory requirements in such a way that the occupier does not accept responsibility for pointing out all breaches in the future. If no action is taken by the site representative to rectify the fault, then his principals should be informed in writing. Such action will, of course, serve as evidence of having taken "all due diligence" to secure compliance with the Act.

DISCUSSION

Some of the points made by Mr. Palmer and representatives of the Inspector of Factories in reply to questions were as follows:—

One party can only indemnify another party if the second party has some liability in the matter in respect of which the indemnity is offered. Many standard forms of contract include an indemnity clause. In this connection it was pointed out that no one can contract out of a statutory liability. The criminal responsibility must rest with the person who is responsible under the Act. The employer of workmen is responsible under the Building Regulations. Claims and damages based on negligence are normally against the employer. The occupier can be liable if he has supplied equipment responsible for an accident, or directly controlled the manner in which the job has been done.

The occupier should take an interest in the work of the contractor, but in such a way as not to relieve the contractor of his responsibility. The normal procedure was for the safety officer of the occupiers to keep in close touch with the foreman or safety officer of the contractors, regular meetings being held where the job is a large one.

As regards the reporting of accidents, it was the duty of the employer to report to the Factory Inspector, even when that employer is a sub-contractor. As a matter of courtesy he should normally also report the accident to the main contractor, or the occupier. For the purposes of the Factory Act, contractors and sub-contractors were themselves occupiers.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchants warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	3	10
Pit Sand	„	1	2	11
Washed Sand	„	1	4	5
¾ in. Shingle	„	1	0	9
¾ in. Broken Brick	„	1	0	0
Pan Breeze	„		10	3
Fine or Coarse Foamed Slag Aggregate ... ... 2 yds. of fine and 2.6 yds. of coarse per ton	per ton	3	0	9

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
6-ton loads and upwards, site	per ton	4	16	6
1 to 6 tons, site	„	5	5	6
Rapid Hardening Cement in 6-ton loads and upwards to site	„	5	4	6
1 to 6 ton do. site	„	5	13	6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colorcrete in 6-ton lots ...	„	6	18	0
Other colours according to colour.				
In 4-ton lots from 211s. 9d. to 435s. 9d. per ton.				
White Portland Cement	„	12	17	0
Under 1 ton	per cwt.		15	4
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards	per ton	6	9	0
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £9 4s. 3d. to £10 17s. 9d. (1-ton loads and upwards).				
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up	„	14	0	9
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	„	6	2	3

BRICKS

		£	s.	d.
Full Loads.				
First Hard Stocks	per 1,000	11	7	0
Second Hard Stocks	„	10	11	0
Mild Stocks	„	8	16	6
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.				
2½ in. Nominal Fletton Bricks to sites in W.C. District Commons	„	5	13	0
Cellular do.	„	5	13	0
Keyed do.	„	5	15	0
Rustics	„	6	18	0
Cellular Rustics	„	6	18	0
Single Bullnose do.	„	6	13	0
Sandfaced	„	7	13	0
Best Blue Pressed Staffs (London Stations) ...	„	24	19	6
Do. Bullnose (London Stations)	„	25	13	6
Blue Wire Cuts (London Stations)	„	22	11	0
Midhurst Lime Bricks (London Sites)	„	10	3	0
Uxbridge Whites (London Sites)	„	9	1	6
Special Purpose Sandlime Bricks (London Sites) ...	„	7	14	0
2½ in. Best Stourbridge Fire Bricks (London Stations)	„	24	6	0
3 in. do. (London Stations)	„	29	3	3
2½ in. Machine - made Sandfaced Red Facings (London Sites)	„	13	19	6
2½ in. Machine-made Multi Red Facings (London Sites)	„	14	4	6
2½ in. Hand-made Sandfaced Red Facings (London Sites)	„	14	11	0
2½ in. Hand-made Sandfaced Multi-Colour Facings (London Sites)	„	14	11	0
Hand-made Sandfaced Cherry Red Facings. Berkshire district (London Sites)	„	17	5	6
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London Sites)	„	17	5	6
Rubber Bricks for gauged arches (London Sites) ...	per 1,000	41	10	0
2½ in. Surrey Clamp Burnt Multi Stock Facings (London Sites)	„	13	6	0
2½ in. Surrey Kiln Burnt Multi Stock Facings (London Sites)	„	14	4	6
Glazed Bricks (London Sites), White, Ivory, Brown—				
Stretchers	„	64	0	0
Headers	„	63	0	0
Quoins, Bullnose and 4½ in. Flats	„	80	0	0
Double Stretchers	„	85	0	0
Double Headers	„	77	10	0
One side and two ends	„	87	0	0
Two sides and one end	„	89	10	0
Splays and Squints	„	83	0	0
Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 7½% for Best quality and plus 7½% less 10% for Second quality.				

PARTITION SLABS, etc.

Delivered Central London Area.

			£	s.	d.
Hollow Clay Partition Blocks (Keyed)					
	Minimum lorry loads.				
*2 in.	140 yds.	per yd. sup.		4	3
*2½ in.	140 yds.	„		4	6
*3 in.	120 yds.	„		5	2
Building Blocks (Keyed)					
*4 in. (6 cavity) ...	95 yds.	„		6	7
6 in. (8⅝" × 5⅝") ...	1250 Blocks	per 1000	25	14	0
*Half blocks at no extra charge.					
Clinker Concrete					
2 in.	100 yds.	per yd. sup.		3	7
2½ in.	85 yds.	„		4	2
3 in.	75 yds.	„		5	0
4 in.	55 yds.	„		6	2
Cranham					
2 in.		„		6	8
2½ in.		„		7	4
3 in.		„		8	7
4 in.		„		10	7
4½ in. Load bearing quality		„		11	8
Floor Blocks and Filler Tiles					
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads		per 1,000	32	11	0
4 in. do.		„	34	18	0
5 in. do.		„	41	11	0
6 in. do.		„	46	16	0
7 in. do.		„	56	18	0
8 in. do.		„	66	14	0
10" × 3" × ⅝" Filler Tiles in multiples of 10 tiles		per 1,000 multiples	56	2	0
12" × 3" × ⅝" do.	do.	„ „	63	17	0
10" × 4" × ⅝" do.	do.	„ „	69	14	0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Standard List prices delivered London Area.

	Over 2 tons	Over 100 Pieces under 2 tons	Under 100 Pieces under 2 tons
Best Quality	+67½%	+97½%	+107½%
B.S.S. Best do.	+10% +67½%	+10% +97½%	+10% +107½%
Tested Quality	+37½% +67½%	+37½% +97½%	+37½% +107½%
B.S.S. Tested do.	+47½% +67½%	+47½% +97½%	+47½% +107½%

		£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths)	per 1,000	10	13	6
4 in. do.	„	14	2	0

STONE

		£	s.	d.
Bath Stone—				
Monks Park	per ft. cube		7	10
St. Aldhelm Box Ground	„		8	10
Delivered in railway trucks at South Lambeth B.R. Western Region				
Doulting Stone Random Blocks. Delivered London area	„		8	7
Beer Stone. Delivered London area	„		8	0
Portland Stone—				
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region	„		8	1½
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.				
9 in. × 3 in. Rubbed, weathered, throated and stooled cills	per ft. cube	3	4	3
12 in. × 6 in. do. do.	„	2	6	0
12 in. × 3 in. Plain coping, twice throated ...	„	1	15	4
12 in. × 3 in. Weathered and twice throated coping	„	2	7	4
14 in. × 6 in. do. do.	„	2	2	8
4½ in. × 9 in. Plinth, rubbed on top and face ...	„	1	18	1
3 in. sawn two sides Slabs, random sizes	per ft. sup.		6	9

STONE—*continued*

		£	s.	d.
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ...	per ft. cube	1	3	5
Do. do. fair one edge for fair faced brickwork		1	7	10
Hard York—				
12in. × 2in. Square Steps, rubbed on top and edge	per ft. run		8	2
14 in. × 3 in. Round-nosed Steps, rubbed on top and front	per ft. cube	2	3	8
12 in. × 6 in. Plain Steps, rubbed top and front ...	,,	1	18	3
2 in. Rubbed and Jointed Paving, given sizes ...	per ft. sup.		7	10
2 in. Sawn Paving, edges squared, in random sizes	per yd. sup	2	13	10

TILES and PANTILES

Delivered London area by road in 6 tons or over per 1,000

Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	8	0
Hand-made Pantiles Berkshire district	47	10	0
Hand-made Double Roman Bridgwater district	58	13	6
Hand-made 10½ × 6½ tiles Berkshire district	13	1	9
Machine-made 10½ × 6½ Staffordshire district	13	8	9
Hand-made Hip and Valley tiles per doz.	1	8	9
Machine-made Hip and Valley tiles do.	1	6	6
Concrete tiles 10½ × 6½	7	14	6
do. Interlocking (49S)	18	9	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual

24 × 12	113	0	4
22 × 12	93	16	0
22 × 11	84	15	0
20 × 12	79	19	6
20 × 10	74	12	0
18 × 10	53	18	9
18 × 9	47	5	6
16 × 10	44	7	0
16 × 8	34	10	6

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—						
Joinery quality	Ex. Wharf	per standard		£110 to £130		
Carcassing quality	do.	,,		£98 to £102		
1 in. Tongued and Grooved Flooring	do.	,,		£108	0	0
Hardwood—						
Mahogany—African S.E. ...	do.	per ft. cube		1	10	0
do. Honduras do. ...	do.	,,		3	5	0
Oak European do. ...	do.	,,		2	5	0
do. Japanese do. ...	do.	,,		2	10	0
do. English Logs sawn	do.	,,		1	15	0
Teak 8 in. average S.E.	do.	,,		3	5	0
Walnut African Logs sawn	do.	,,		1	5	0

DOORS (in Lots I-II)

Delivered London area.

1½ in. 4 Horizontal Panel Pattern 4 in. deal				
2 ft. 0 in. × 6 ft. 6 in.	each	1	12	0
2 ft. 3 in. × 6 ft. 6 in.	,,	1	13	0
2 ft. 6 in. × 6 ft. 6 in.	,,	1	14	0
2 ft. 9 in. × 6 ft. 6 in.	,,	1	16	6
2 in. do. but top panel open. Pattern 4 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	,,	2	9	0
2 ft. 9 in. × 6 ft. 6 in.	,,	2	11	6
2 in. Panel, top panel open. Pattern 2 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	,,	2	1	9
2 ft. 9 in. × 6 ft. 6 in.	,,	2	3	6

SUNDRIES

Delivered London area

1 in. Wood Wool Slabs, 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton)	per yd.	5	8
1½ in. do. (67 yds. to 1 ton)	,,	7	4
2 in. do. (52 yds. to 1 ton)	,,	8	11½
2½ in. do. (45 yds. to 1 ton)	,,	10	3
3 in. do. (39 yds. to 1 ton)	,,	11	5½
Quantities under 1 ton add 1d. per ½ in. of thickness.			
½ in. imported insulation Board, quantities over 5,000 sq. ft.	per 100 sq. ft.	2	2	6
¼ in. Hardboard do.	,,	2	1	6
⅛ in. do. do.	,,	3	2	6
⅛ in. Asbestos Flat Building Sheets	per yd. sup		3	2
Roofing Felt, 1-ply	,,		1	6
do. 2-ply	,,		1	9
Best Scotch Glue, in slabs	per ½ cwt.	5	0	0
do. pearl	,,	5	5	0
Croid Glue	28 lb.	2	6	0
Cut Nails 3 in. (1-ton lots)	per ton	58	5	0
do. 4 in. and up (1-ton lots)	,,	54	15	0
Wire Nails, 3 in. (4-cwt. lots)	per cwt.	2	16	3
do. 4 in. and up (4-cwt. lots)	,,	2	12	9

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in. 12 in. × 6 in. plain cut to lengths delivered London area	per ton	39	0	0
Extra for sizes				
3 in. × 1½ in., 4 in. × 1½ in.	,,	3	10	0
3 in. × 3 in.	,,	2	10	0
4 in. × 3 in., 10 in. × 4½ in.	,,	1	10	0
5 in. × 2½ in., 5 in. × 3 in.	,,	1	15	0
4½ in. × 1½ in.	,,	3	5	0

		£	s.	d.
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ...	per ton		15	0
6 in. × 3 in. 24 in. × 7½ in.	,,	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. ...	,,	1	5	0
9 in. × 4 in. 10 in. × 5 in.		1	0	0
12 in. × 5 in. 22 in. × 7 in.				
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in.				
14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in.				
15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in.	,,		10	0
16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in.				
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in.				
Steel angles average price	,,	40	15	0
Steel tees average price	,,	41	15	0
Fabricated work delivered London—				
R.S. Joists cut and fitted	,,	55	10	0
Compound girders	,,	61	0	0
Stanchions	,,	66	10	0
Compound stanchions	,,	70	5	0
In Roof Work—Trusses and Purlins	,,	83	0	0
Average prices not for awkward work.				
Mild Steel Ferro-Concrete bars to BSS785 ex London				
Stock ⅜ in. diam., and upwards	,,	40	6	0
½ in. diam. ... ...per ton extra		4	7	0
⅝ in. do.	,,	3	7	0
¾ in. do.	,,	2	9	6
½ in. do.	,,	1	12	0

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	W.I. Fittings	Malleable Fittings
Class A NET		
Class B + 9½%	Light + 24½%	Malleable List — 35% + 40%
Class C + 25½%	Heavy + 32%	
Black—		
Class A — 21½%		
Class B — 11%	Light + 11½%	Malleable List — 35%
Class C + 1½%	Heavy + 19½%	

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	3/3½	2/11	/10
3½ in.	3/7	3/2	/10
4 in.	4/7½	3/7	1/3
4½ in.	5/1	4/-	1/6
5 in.	5/8	4/4	1/9

C.I.O.G. GUTTERS

3 in.	4/3	3/10	1/-
3½ in.	4/9	3/10	1/3
4 in.	5/3	4/-	1/6
4½ in.	5/8	4/7	1/9
5 in.	6/2½	5/3	2/-

C.I. RAIN-WATER PIPES

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	7/0½	3/7	5/2
2½ in.	7/0½	4/-	6/11
3 in.	7/11	5/-	7/6
3½ in.	9/-	5/11	9/-
4 in.	10/5	7/2	10/8

L.C.C. COATED SOIL PIPES

2 in.	8/-	6/2	7/6
2½ in.	8/5	6/10	9/4
3 in.	9/5½	7/6	11/1
3½ in.	10/7	9/4	12/11
4 in.	12/0½	10/5	15/3

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated 1st February, 1955, + 2½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. COATED DRAIN PIPES

In 9-fts.	cwt. qr. lb.	per yd.	Bends	Branches
4 in.	1 1 17	24/10	17/3	30/6
6 in.	2 0 1	36/10	36/-	62/-

ASBESTOS RAIN-WATER PIPES AND FITTINGS

All less 17½ per cent. discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths	...per yd.	3/9	4/-	4/10	6/5
Shoes	... each	2/5	2/8	3/2	4/3
Single Branches	... ,,	3/9	4/6	5/4	7/6
Bends square or obtuse	,,	2/8	2/11	3/9	5/4
Swan Necks 4½ in. proj.	,,	2/11	3/9	4/3	5/11
do. 6 in. do.	,,	3/2	3/9	4/10	6/5

ASBESTOS O.G. GUTTERS AND FITTINGS

		4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths	...per yd.	3/7	3/11	4/8	5/7½
Drop ends	each	2/10	3/4	3/10	4/7
Stop Ends	,,	/10	/11	1/-	1/2
Angles	,,	2/11	3/5	4/1	4/10
Nozzles	,,	2/10	3/4	3/10	4/7
Union Clips	,,	1/5	1/8	2/1	2/5

ASBESTOS HALF-ROUND GUTTERS AND FITTINGS

		3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths	...per yd.	2/6	2/11½	3/0½	3/7	5/-
Drop ends	each	2/1	2/5	2/8	2/11	4/3
Stop ends	,,	/9	/10	/11	1/-	1/2
Angles	,,	2/5	2/8	2/11	3/2	4/3
Nozzles	,,	2/1	2/5	2/8	2/11	4/3
Union Clips	,,	1/-	1/1	1/2	1/4	2/-

METALS—*continued*

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	41 17 6
Mild Steel Bars	37 14 0
Mild Steel Hoops	39 1 0

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	49 6 0
24 gauge	51 16 0
26 gauge	54 16 0
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	56 6 6
24 gauge	59 16 6
26 gauge	65 1 6
Galvanised Flat sheets C.R. and C.A.—	
20 gauge	57 16 6
24 gauge	61 6 6
26 gauge	66 11 6

Plumbers' Brass Work, Copper, Zinc, etc.

Delivered in London area.

All per doz. M.O.H.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	77/-	114/6				
Toilet bib cocks for iron	99/-	142/-				
Screwdown stop cocks for iron	66/-	95/9	188/-	323/6	462/-	815/-
do. with two unions for lead	89/-	132/-	234/4	419/-	554/6	1234/3
Double nut boiler screws	16/6	23/3	42/-	43/-	59/6	83/8
Heavy Croydon ball valves	68/3	155/3	237/7	433/6	614/-	
Plumbers' union brass lead to iron	17/4	21/-	34/9	60/6	74/6	145/3
	1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	29/9	36/4	52/9	82/6	105/6	137/6
Brass sleeves		27/6	27/6	49/6	66/-	67/-
	1¼ × 6 lb.		1½ × 6 lb.	2 × 7 lb.	3 × 7 lb.	
Lead P. trap with brass cleaning screws	63/6		79/6	127/-	217/3	
Lead S. trap do.	77/-		95/-	156/3	281/-	

Solder	s. d.
Plumbers' per lb.	3 5
Tinmen's „	4 2
Blow pipe „	4 3

Copper tubes BSS 659/1944 on the basic price of 41¾d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.	Total per lb. d.
⅛ in. × 19 gauge	13	54⅜
¼ in. × 19 „	11½	53⅛
1 in. × 18 „	9⅞	51⅝
1¼ in. × 18 „	9¼	51
1½ in. × 18 „	9¼	51
2 in. × 17 „	10⅞	52⅝

	£ s. d.
Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras per ton	426 15 0
Sheet Zinc 10 gauge (25 SWG) 5 cwt. lots upwards per cwt.	8 6 0
do. 12 gauge (23 SWG) do. „	8 4 0
do. 14 gauge (21 SWG) do. „	8 3 0
Brass tubes basic price, plus gauge and manufacturing extras per lb.	2 8⅞

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

	£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards per ton	140 5 0
Lead Water Pipe in coils „	141 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia. „	143 0 0
do. over 4 in. dia. „	145 0 0
Lead Gas or Untinned Compo pipe „	143 0 0
Extras over Basis for quantities under 1 ton	
5 cwt. and under 1 ton per cwt.	2 0
3 cwt. do. 5 cwt. „	4 0
1 cwt. do. 3 cwt. „	6 0

Smaller quantities than 1 cwt. priced specially.
Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.
Allowance for Old Lead, collected £99 0s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

	£ s. d.
Coarse Pink in 1-ton loads and over Delivered on Site per ton	7 6 6
do. White do. do. „	7 14 3
Sirapite Coarse do. do. „	7 9 0
do. Fine do. do. „	7 17 0
Blue Lias Lime in 6-ton loads „	6 9 6
Hydrated Lime do. „	5 12 6
Lump Lime do. „	5 2 0
White Keen's or Parian Cement in 1-ton loads „	10 4 0
Pink Keen's or Parian Cement in 1-ton loads „	9 18 6
Granite Chips in 6-ton loads „	2 6 3
Hair per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site per yd.	2 3
1,200 yds. „	2 2½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ⅜ in. thick, 600 yds. and over in one delivery. Delivered site „	2 6
1,200 yds. „	2 5½

PAINT AND DISTEMPER

Delivered London area.

	£ s. d.
Ceiling Distemper per cwt.	1 7 6
Washable Distemper „	5 5 0
Gloss Paint per gal.	2 10 0
Snowcem cement paint (in 1 cwt. drums) per cwt.	3 11 0

Lead Products and Oils.

	£ s. d.
Ground White Lead, 1 cwt. kegs per cwt.	8 18 0
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins per gal.	3 2 0
Genuine Red Lead, Dry, 1 cwt. keg per cwt.	6 19 3
Genuine Linseed Oil Putty, 1 cwt. keg „	2 11 0
Size XD quality, 28 lb. per tin	9 0
Raw Linseed Oil (5 gal.) Drums extra per gal.	12 0
Boiled Linseed Oil (5 gal.) do. „	12 6

Sundries.

	£ s. d.
Turpentine substitute (5 gal.) drums extra „	5 6½
do. do. (40 gal.) do. do. „	4 8½
Solignum, Brown (5 gal. cans) Exterior „	6 6
Creosote (40 gal. barrels) „	2 0
Paste Powder (1 lb. packets) per lb.	1 6
White Lining Paper per piece	1 0

VARNISHES, etc.

Delivered London area.

	£ s. d.
Oak Varnish, Outside or Inside per gal.	1 12 0
Oak Pale Copal do. „	1 18 0
Hard Drying Oak for Inside „	2 0 0
Crystal Paper Varnish do. „	2 0 0
Eggshell Flat Varnish do. „	2 14 0
Finest Carriage Varnish „	2 10 0
Front Door Varnish „	2 0 0
Japan Gold Size „	1 12 6
Black Japan „	1 14 0
Brunswick Black „	1 10 0
Berlin Black „	1 5 0
Terebene „	1 8 0
Knotting (1 gal. bottles free) „	2 2 0
French and Brush Polish (do.) „	1 18 0

GLASS

Delivered London area.

	Per ft. super s. d.
18 oz. Sheet Glass Ordinary Glazing Quality. Cut Sizes	5½
24 oz. „ „ „ „ „ „	7½
26 oz. „ „ „ „ „ „	10
32 oz. „ „ „ „ „ „	1 1
⅛ in. Rolled Plate	9
3/16 in. and ¼ in. Rough Cast	1 0
⅛ in. Figured Rolled and Cathedral, Standard patterns : White	9
do. Standard Tints	1 4½
do. Special Tints	2 9
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating	1 1
¼ in. Wired Cast	1 2
¼ in. Georgian Wired Cast	1 2½

Hollow Glass Blocks—	Each
P.B.2 5⅜ × 5⅜ × 3⅞ in.	2 9
P.B.3 7⅜ × 7⅜ × 3⅞ in.	4 2
P.B.32 7¾ × 7¾ × 3⅞ in.	4 2
Radiused Corner Blocks to match up with—	
P.B. 2	5 3
P.B. 3	6 9
P.B. 32	6 9

¼ in. Polished Plate Glass, G.G. Quality—	Per ft. super
In plates not exceeding 2 ft. sup.	3 7
„ „ „ 5 ft. sup.	4 5
„ „ „ 45 ft. sup.	5 1
„ „ „ 100 ft. sup.	5 6

¼ in. Polished Plate, extra sizes, *i.e.* plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality —Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways

Not exceeding 180 ft. sup. or ditto	8 4
Not exceeding 200 ft. sup. or ditto	11 3
Plates exceeding 200 ft. sup., prices on application.	16 0

Substances other than ¼ in. Polished Plate at Special Prices.

Quantity Tariff—Sheet and Sundry Glass.
The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. super s. d.
18 oz. sheet O.Q.	3,000	4½
24 oz. „ „	2,000	6½
26 oz. „ „	2,000	7½
32 oz. „ „	2,000	10½
⅛ in. Rolled Plate	1,000	7½
¼ in. Figured Rolled and Cathedral Standard Patterns, White	1,000	7½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte	1,000	10½
3/16 in. and ¼ in. Rolled Plate or Rough Cast	2,000	10½
¼ in. Wired Cast, Hexagonal	2,000	11½
¼ in. Georgian Wired Cast	2,000	1 0½

The Builder CURRENT RATES OF WAGES

AS FROM FEBRUARY 7, 1955. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1	A2	A3
Craftsmen	3/9½	3/9	3/8½	3/8
Labourers	3/4	3/3½	3/3	3/2½

Town.	Grade.
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A2
Accrington	A
Addlestone	A
Aldeburgh	A2
Aldershot District	A2
Alfreton U.D.	A
Alnwick	A1
Altrincham	A
Amble	A1
Amersham	A1
Ammanford	A
Andover	A2
Ardingly	A2
Arundel	A2
Ascot	A2
Ashby-de-la-Zouch U.D.	A
Ashby Woulds U.D.	A
Ashford (Kent)	A2
Ashford (Middlesex)	A
Ashington	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A2
Atherstone R.D. (parts of)	A
Aylesbury	A2
Aylesby (Yorks).	A
Aylesham	A2
Bagshot	A2
Bakewell U.D.	A2
Banbury	A2
Barnard Castle U.D.	A
Barnoldswick U.D.	A
Barnsley	A
Barrow-in-Furness	A
Barrow-upon-Soar R.D. (exc. Thrussington A2)	A
Barry	A
Basford R.D.(exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley	A
Baxterley	A1
Beaconsfield & District	A1
Beamish	A
Bearl	A
Bearpark	A
Beccles	A2
Bedale R.D.	A
Bedford	A
Bedlington	A
Bedwas	A
Beeston & Stapleford U.D.	A
Belper U.D.	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick District	A
Beverley	A
Bexhill-on-Sea	A2
Biggleswade	A2
Billericay	A
Billing	A
Billingham U.D.	A
Bilsthorpe	A
Birchington	A2
Birkenhead	*
Birmingham C.B.	†A
Bishop Auckland	A
Bishop's Stortford	A
Bispham	A
Blackburn	A
Blackpool	A
Blackwell R.D.	A
Blaydon U.D.	A
Blidworth	A
Blyth	A
Bognor Regis	A2
Boldon U.D.	A
Bolsover U.D.	A
Bolton	A
Bourne End	A1
Bournemouth District	A
Bracknell	A2
Bradford	A
Bradford-on-Avon	A2
Braintree	A1
Breconshire, County of	‡A2
Brent Knoll	A2
Brentwood	A
Bridlington	A
Brierfield	A
Brighouse	A
Brighton	A
Bristol	A
Broadstairs	A2
Bromsgrove U.D.	A
Brough	A
Broughton (Cheshire)	A
Buckley	A
Bungay	A2
Burnham-on-Crouch	A2
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Calder Valley	A
Cambridge	A
Cannock U.D.	A
Canterbury	A2
Cardiff	A
Cardiganshire, County of	‡A2
Carlisle	A
Carmarthenshire, Cnty of	‡A2
Caernarvonshire, Cnty. of	‡A2
Carnforth	A
Castleford	A
Caterham	A
Chapel-en-le-Frith	A
Charmy Down	A
Chatham & District	A1
Cheadle (Staffs) R.D.	A
Chelmsford	A
Cheltenham	A
Chepstow	A1
Chertsey	A
Chester	A
Chesterfield M.B.	A
Chesterfield R.D.	A
Chester-le-Street U.D.	A
Chichester	A2
Chippenham (inc. Chippenham Within and Hardenhuish)	A2
Chorley	A
Clacton	A1
Cleethorpes	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville U.D.	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett	A
Conway	A1
Cornwall, County of	‡A2
Coventry C.B.	A
Cranbrook	A2
Cranleigh	A2
Crawley (Sussex)	A1
Crewe	A
Cromer	A1
Crowborough	A2
Cuckfield	A2
Dalton-in-Furness	A
Darlington District	A
Darwen	A
Deal	A2
Denbigh Town	A2
Derby C.B.	A
Devizes	A2
Devon, County of	‡A2
Dewsbury	A
Didcot	A2
Diss	A2
Doncaster C.B.	A
Dorking	A
Dorset, County of (except-ing Poole, Swanage and Wimborne A1)	A2
Dover	A2
Dovercourt	A
Driffield U.D.	A1
Droitwich M.B.	A
Dudley M.B.	A
Dunstable	A
Durham City	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A2
Eastwood (Notts.) U.D.	A
Ebbw Vale & District	A
Edenbridge	A2
Ely	A
Epping	A
Exeter	A
Fakenham	A2
Falmouth	A2
Fareham	A
Faversham	A2
Felixstowe	A1
Filey U.D.	A
Fleetwood	A
Flint	A
Folkestone	A2
Frinton	A1
Frome	A
Gainsborough U.D.	A
Gateshead	A
Gillingham (Kent)	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A2
Godalming	A2
Goole M.B.	A
Gosport	A
Grantham M.B.	A
Gravesend	A
Great Yarmouth	A
Grimsby C.B. & R.D.(part)	A
Grimsby R.D. (remainder)	A2
Guildford District	A2
Guilsborough	A1
Guiseley	A
Halesowen M.B.	A
Halifax	A
Halstead	A2
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate	A
Hartlepool	A
Harwich	A
Haslemere	A2
Hastings	A2
Hatfield (Herts.)	A
Haywards Heath	A2
Hemel Hempstead	A
Henley-on-Thames	A2
Hereford	A2
Herefordshire, Cnty. of	‡A2
Herne Bay	A2
Hertford	A
Hexham U.D.	A
Heysham	A
High Wycombe	A1
Highworth	A2
Hinckley U.D.	A
Hitchin	A
Hoddesdon	A
Horley	A2
Horsham	A2
Horwich	A
Huddersfield	A
Hull	A
Hunstanton	A2
Huntingdon (Staffs)	A
Ilkley	A
Ingatestone	A1
Ipswich	A
Isle of Sheppey	A2
Isle of Thanet	A2
Isle of Wight	A2
Jarrow M.B.	A
Keighley	A
Kendal	A
Kenilworth U.D.	A
Kettering M.B.	A
Keynsham	A
Kidderminster M.B.	A
King's Lynn	A1
Kingskerswell	A1
Kingsteignton	A1
Kirkham	A
Knaresborough U.D.	A
Knowle	A1
Lancaster	A
Leamington M.B.	A
Leatherhead	A
Leeds	A
Leicester C.B.	A
Leighton Buzzard	A1
Letchworth	A1
Lewes	A2
Lichfield M.B.	A
Lincoln C.B.	A
Littlehampton	A2
Liverpool	*
Llandudno	A1
Llanelly	A
London	*
Long Eaton	A
Loughborough M.B.	A
Louth M.B.	A2
Lowestoft	A
Loxton	A2
Luton	A
Lyneham (Devon)	A2
Macclesfield	A
Maidenhead	A1
Maidstone	A1
Maltby	A
Maldon (Essex)	A1
Malvern U.D.	A1
Manchester	A
Manningtree	A1
Mansfield M.B.	A
March	A2
Margate	A2
Market Harborough U.D.	A
Maryport	A
Matlock U.D.	A1
Melksham	A2
Melton Constable	A2
Melton Mowbray U.D.	A1
Merthyr	A
Middlesbrough	A
Middleton	A
Middlewich	A
Milford Haven	A1
Morecambe	A
Morley	A
Mundesley	A2
Nantwich	A
Nelson	A
Newark-on-Trent R.D.	A1
Newbury	A2
Newcastle-on-Tyne	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A2
Newton Abbot	A1
Northallerton Dist.	A
Northampton C.B.	A
North Shields	A
Norton Radstock	A1
Norwich	A
Nottingham C.B.	A
Nuneaton M.B.	A
Oakham U.D.	A2
Oldham	A
Ongar	A
Ormskirk	A
Ossett and Horbury	A
Oxford	A
Oxted	A1
Paignton	A1
Peterborough	A
,, Soke	A1
Pickering	A3
Plymouth	A
Pontefract	A
Pontypridd District	A
Portishead	A
Portland Stoneyards	A
Portsmouth	A
Port Talbot	A
Preston	A
Pudsey	A
Pulborough	A2
Radnorshire, County of	‡A2
Ramsgate	A2
Rayleigh	A
Reading	A
Redcar B.	A
Redditch U.D.	A
Redhill and Reigate	A
Ripon	A3
Rochdale	A
Rochester	A1
Rotherham	A
Rugby M.B.	A
Saffron Walden	A2
St. Albans	A
St. Helens	A
St. Neots	A2
Salisbury City	A2
Salisbury Plain	A2
Sawbridgeworth	A
Saxmundham	A2
Scarborough	A
Scunthorpe	A
Selby	A
Sevenoaks	A1
Sheerness	A2
Sheffield	A
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury M.B.	A
Sittingbourne	A2
Skegness U.D.	A1
Skipton U.D.	A
Sleaford U.D.	A2
Slough	A
Smethwick C.B.	†A
Snettisham	A2
Somerset, County of	‡A2
Southampton	A
Southend-on-Sea Dist.	A
Southport	A
South Shields C.B.	A
Spalding U.D.	A2
Stafford M.B.	A
Staines	A
Stamford M.B.	A1
Stantonwick	A
Stevenage	A
Stockport	A
Stockton R.D.	A
Stockton-on-Tees	A
Stoke-on-Trent C.B.	A
Stoke Orchard	A1
Stourbridge M.B.	A
Stourport U.D.	A
Stowmarket	A1
Stratford-on-Avon M.B.	A
Sunderland District	A
Sunningdale	A1
Sutton Coldfield M.B.	A
Swaffham	A2
Swanage	A1
Swansea	A
Swindon	A
Swinton U.D.	A
Tamworth M.B.	A
Tenterden	A2
Tewkesbury	A1
Thames Haven	A
Thetford	A2
Thorpe Bay	A
Thurrock U.D.C. Area	A
,, North of, to Billericay	A
Tilbury	A
Todmorden	A
Tonbridge	A1
Torquay	A1
Totnes	A2
Trowbridge	A1
Tunbridge Wells	A
Tynemouth C.B.	A
Uppingham (Salop)	A1
Uttoxeter U.D.	A2
Wakefield	A
Walisend B.	A
Walsall C.B.	A
Walsden	A1
Walton-on-Naze	A
Ware	A2
Warminster	A
Warrington	A
Warwick M.B.	A
Wellington U.D.	A
Wells (Norfolk)	A2
Welwyn	A
Welwyn Gar. City	A
West Bromwich C.B.	A2
Westbury	A
Westcliff-on-Sea	A1
Westerham	A1
Weston-super-Mare	A
Weybridge	A1
Weymouth	A1
Whitby U.D.	A2
Whitstable and District	A
Wickford	A
Widnes	A
Wigan	A2
Wigton	A
Willington	A
Wilmslow	‡A2
Wilts. County of	A1
Winchester	A2
Windermere	A
Windsor and Eton	A2
Wisbech	A1
Witham	A1
Woking (District)	A
Wokingham	A2
Wolverhampton C.B.	A
Woodbridge	A2
Worcester C.B.	A
Workington	A
Worksop M.B.	A2
Worthing	A
Wrexham (incl. Cefn)	A1
Wroughton	A
Wylam	A2
Wymondham	A
York	A

For Birkenhead, Liverpool and London the rates are:—Craftsmen, 3s. 11d.; Labourers, 3s. 5½d. In the case of London the rate beyond the 12-mile radius is:—Craftsmen, 3s. 10½d.; Labourers, 3s. 5d. †Plus 2d. per working day. ‡ This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 2s. 11d. per hour. Women engaged on work other than craft processes, 2s. 7d. per hour.

For Building Trade Wages in Scotland see page 612

NEWS IN BRIEF

THE LATE MR. A. K. LINGARD

The death occurred on March 16 of Mr. A. K. Lingard, sales manager of Permanite, Ltd., since 1948. Mr. Lingard had been in ill health for some months. He is now succeeded by Mr. J. S. Sheppard, who has shared the duties of sales manager since the beginning of this year.

TEACHERS' CONFERENCE

A regional one-day conference for teachers of building subjects and members of the industry will be held by the Southern Regional Council for Further Education at Reading University on June 18. The theme of the conference will be "Good Building—Planning and Practice," and the chairman will be Mr. W. S. Jones, MIOB, immediate past-president, Southern Counties Federation of Building Trades Employers. Particulars from the Secretary of the Council, 22, The Forbury, Reading.

DOOR MANUFACTURERS' AGM

The annual general meeting of the Flush Door Manufacturers' Association, Ltd., Trowell, Nottingham, was held at the Waldorf Hotel, London, on March 22. Mr. R. A. Brough was reappointed chairman for the ensuing year; Mr. E. P. Lawrence as vice-chairman; and the Council were re-elected as before. The chairman reported that the Association were being represented on the British Standards Institution Committee on flush doors, and that negotiations were also nearing the completion stage on standardisation of conditions of contract relating to nominated suppliers.

CAMBRIDGE PRIZE-GIVING

The annual prize distribution for 1955 of the Cambridgeshire Technical College and School of Art was held on March 24 at the college premises in Collier-road, Cambridge. Mr. H. S. Johnson, chairman of the Building and Allied Trades Advisory Committee for the College, was chairman for the evening. In presenting the prizes to the students, Mr. F. L. Wallis, president of the Institute of Builders, advised the apprentices to work with their hands and head, and also with the heart. He felt that there was nothing worse than having a beautiful design spoilt by bad craftsmanship. After the prize distribution, visits were paid by parents and friends to an exhibition of articles made by the students.

WALLASEY DEVELOPMENT PLAN

The Minister of Housing and Local Government has approved with modifications the development plan for the County Borough of Wallasey.

ALUMINIUM WALLS FOR FLATS

A ten-storey block of flats with the outer walls made of aluminium is now being built in Kristiansand, Norway. The block, with altogether 65 flats, will be ready in July. According to the Oslo newspaper "Aftenposten," the flats are the first in Europe to be built with aluminium walls. The loss of heat through these walls is claimed to be only half as much as that through traditional walls. The architect for the flats, Hans Mollo-Christensen, is to build two more blocks of flats in Kristiansand with aluminium walls. In Oslo, too, a number of houses and flats to be built by the Ministry of Finance for civil servants are to have aluminium walls.

RSI MUSEUM RE-MODELLED

The Council of the Royal Sanitary Institute has approved the plans submitted by Sir Hugh Casson, MA, FRIBA, for the remodelling of its Museum of Health at 90 Buckingham Palace-road, SW1. The scheme, which will involve an expenditure of several thousand pounds, will be put in hand at an early date. The new plans include a number of structural alterations, such as a new translucent suspended ceiling, new wall surfaces, the provision of a wider gallery, and a self-contained cinema.

NEW APPOINTMENT

Mr. Bryan Archer, ARIBA, has been appointed architect (technical development) to Gilksten Building Materials, Carpenters-road, Stratford, E15. Mr. Archer will mainly be concerned with "Glinex" structural insulation panels for which the company are sole concessionaires in UK.

SURVEYORS' ASSOCIATION FORMED

The Association of Municipal Building Surveyors has been formed. Its aim is to support the interest of local government staff in carrying out the duties of either building inspector or building surveyor to their respective authorities. It is proposed to call a further meeting in May. Details from the Secretary, Mr. J. H. Brown, 6 Kings-road, Westcliff-on-Sea, Essex.

CONCRETE PAVINGS

The annual general meeting of the Pavings Development Group (Concrete and Soil-Cement), was held at the Institution of Civil Engineers, 5 Great George-street, SW1, on March 30. Two new road booklets dealing with concrete road construction, produced by the Cement and Concrete Association in collaboration with the Group, were introduced by Mr. A. R. Collins, MBE, MICE, Technical Director of the Association. Five papers describing outstanding concrete highway bridges constructed in various countries were given, including: "Reinforced Concrete Bridges" by Mr. W. A. Fairhurst, MIStructE; "Freyssinet system" by Mr. A. J. Harris, AMICE; "Lee-McCall system" by Mr. R. T. Betts, AMICE; "Magnel system" by Mr. G. Magnel, MIStructE; and "Pre-tensioned and other systems," by Mr. A. W. Hill, AMICE. In the afternoon, a paper on the application of the lessons learned in airfield construction to large scale concrete road works was given by Mr. J. Maurice Laing, and a talk on concrete road construction in the Netherlands by J. C. N. Ringeling, chief engineer, Department of Roads and Waterways, The Hague, Holland.

SAPPER RE-UNION

The third London Sapper Re-union will be held at the Duke of York's Headquarters, Chelsea, SW3, on the evening of April 30. There will be a licensed bar and buffet, and music provided by the band of the Royal Engineers, Chatham. Mr. Mervyn Saunders will be MC, and the function is intended as an all-male occasion for all ranks, serving and ex-service, in London and the Home Counties. Tickets, price 3s. 6d., obtainable from the Hon. Secretary, REA, London Group, Room 31, Horse Guards, SW1.

CHURCH AT BIGGIN HILL

The dismantling and transportation of the disused Church of All Saints at Camberwell to provide materials for a new church and church hall at St. Mark's Church, Biggin Hill, Kent, has now almost been completed, under the direction of the Vicar, The Revd. V. Symons, MA, with the aid of voluntary work. The operations were begun in August, 1952, when the 50 years' old temporary Mission Church was proving inadequate. In connection with assistance given during this first phase, the Vicar has asked us to express his gratitude to the following firms: Mills Scaffold Co., Ltd., who loaned 12,500 ft. of tubular scaffolding and boards; British Crane and Hoist Co., who loaned a hoist and lift; Evans Cook and Co., who gave a 5-ton lorry; and Wingates, Ltd., who loaned cement mixers. Sir Giles Gilbert Scott, Son and Partners, are preparing detail plans for the new parish church and hall. When these are completed the second phase, the rebuilding, will begin, and the help of builders would be appreciated. Offers should be addressed to the Revd. V. Symons, MA, St. Mark's Vicarage, Biggin Hill, Kent (tel.: Biggin Hill 312).

MAINTENANCE TAX RELIEF

To encourage house-owners to have their property redecorated more frequently, Blundell, Spence and Co., Ltd., 9, Upper Thames-street, EC4, are making special efforts to make more widely known the income-tax concessions available. Relief can be obtained on Schedule A tax, which is payable by house-owners and is popularly called "Property Tax." It is essential that the owner should keep all receipts for interior and exterior repairs and decorations for the previous five years, as the tax inspector will wish to see these. The claim is based on the average annual expenditure over a five-year period. From this average figure must be deducted the statutory repairs allowance—the difference between the gross annual value and the net annual value of the house. On the amount that is left, relief from Schedule A tax can be obtained provided this amount is not greater than the net annual value. If it is, relief is obtained to the full amount of the net annual value —which means that no Schedule A tax at all is payable. For owners who have just moved into their house, there are two possible ways of procedure. If the previous owner has claimed the reliefs, the local tax inspector will already have figures relating to that house for the previous period, and he will make these known to the new owner on request, so that the five-year average expenditure on maintenance can be calculated. If no previous figures are available, or if the house is a new one, the owner can base his claim on his actual expenditure during each of the first five years, at the end of which it will be possible to calculate a five-year average

OFFICIAL NOTIFICATION

Higher Trade Mark Fees

THE Board of Trade has announced that as from last Friday (April 1), higher renewal fees will be charged for Trade Marks registrations due to expire after June 30, 1955; and after the latter date there will be a general increase in the fees payable for a number of trade marks matters.

DEMOLITION CONTRACTORS

Annual Luncheon

THE difficulty in the Midlands and in Scotland of finding suitable uses for surplus brick and concrete hard core from demolished structures, was referred to by MR. A. G. GRIFFITHS, hon. life vice-president of the National Federation of Demolition Contractors, at the Federation's annual luncheon held at the Holborn Restaurant, London, on March 30. Mr. W. Horrocks, the president, presided.

Mr. Griffiths, who proposed the toast of "HM Minister of Works," said that in London and the southern counties hardcore was used to good purpose—for foundations, roadmaking, for broken brick aggregate, for the formation of embankments and for many other purposes. Unfortunately, however, this position did not prevail in the Midlands or in Scotland, and these valuable materials became a waste product and a liability.

Mr. Griffiths went on to suggest that in connection with the road development schemes which will begin to be undertaken shortly, the possibility of using this material in those areas should be considered.

A further matter with which the Federation was concerned, Mr. Griffiths continued, was in connection with combined demolition and building tenders. They were still finding that from time to time contracts were put out by the Ministry of Works calling for substantial demolition works followed by rebuilding, the whole embodied in a combined building and demolition specification. The Federation, he said, felt that much advantage would be gained if these could become either separate entities or separate tenders.

Mr. Griffiths said that due to the relaxation of controls they were, as an industry, fully employed at the moment, particularly on site clearance and demolition in preparation for the extended development plans of a number of local authorities. Some of the war-scarred buildings now being removed had for a long time, in his view, constituted dangerous structures.

Replying to Mr. Griffiths, MR. NIGEL BIRCH, Minister of Works, said that he would speak to the Minister of Transport about the suggestion of using surplus supplies of hardcore in the new road construction schemes. On the question of combined demolition and building contracts, he said that he had been advised that normally his department issued tenders separately for these works, but he would make further inquiries into the matter.

Looking ahead, he said that the prospects for the demolition industry were good; it had an important contribution to make in the slum clearance programme.

In reply to the toast of "The President," which was proposed by SIR RICHARD COPPOCK, CBE, MR. HORROCKS remarked on the growth of the NFDC during the past 10 years and expressed the view that the time had arrived for the Federation to seek representation on the National Joint Council for the Building Industry in order that they might take part in future negotiations.

Other speakers at the luncheon were MR. H. W. NORRIS, MIStructE, vice-president, NFDC, and GROUP CAPT. W. S. ALLEN, MIEE.

TRADE NEWS

ELECTRIC GLUEPOT

A gluepot is being manufactured by the General Electric Co., Ltd., Magnet House, Kingsway, WC2, in 1½ and 3 pint sizes. It comprises a separate hotplate and stand with water-jacketed cast iron pots, so that the hotplate and stand can be used separately in workshops and laboratories. If required the two components can be bought as separate units.

HIGH-LIFT TRUCKS AT ALPERTON

The use of high-lift trucks has greatly increased the efficiency of the model depôt run by Dunlop Special Products, Ltd., at Alperton, Middlesex, and a new 20,000 sq. ft. depôt is now being built at Wembley to cope with increasing business. The truck lifts weights of up to 1,800 lb. to a height of nearly 11 ft., making it possible to use the height of the building to the full. This and the placing of rows of stillage at an angle, four on top of each other, reducing the gangway from 11 to 5 ft., enables the depôt to clear each week 72 tons of special products.

NEW SHOWROOMS OPENED

The official opening of their new showrooms at West Bridge, Northampton, was held on Wednesday (April 6) by Travis and Arnold, Ltd. The ceremony was carried out by the film, stage and television star, Miss Moira Lister.

MULTIPLE CONCRETE GARAGES

Fifty multiple concrete garages have been erected on a blitzed site in Coventry. The garages, fitted with up-and-over doors to allow the maximum use of space, were manufactured by Ernest Batley, Ltd., of Coventry, and consist of tongued and grooved concrete units, bolted together on any level foundation to form a block of garages of the required number. Erection was carried out by Laxons, also of Coventry.

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FITTINGS IN COPPER

Copper fittings have been placed on the market by the Yorkshire Copper Works, Ltd., Leeds, which are made from phosphorus deoxidised arsenical copper tube (metal in accordance with British Standard 1174). Used with light gauge copper tubes, they are claimed to be particularly suitable for underground water supplies. They comply with British Standard 864, and are also recommended by the firm for domestic water and gas services.

BUS SHELTER

A cantilevered bus shelter designed to provide minimum pavement obstruction is being manufactured by Henry Hope and Sons, Ltd., 17, Berners-street, W1. The bases and stanchions are of rolled steel, and the cantilevered roof is formed from cast-aluminium ribs covered with 14g sheet aluminium. The shelter requires no deep foundation and gives a minimum headroom of 6 ft. 10 in. It is claimed to be equally suitable for flat pavements or those sloping in one or more directions.

STAIR TREADS

A leaflet on their Jaybee "Suregrip" combined rubber and metal treads can be obtained from Joseph Billingham, Ltd., of Cradley Heath, Staffs. These treads, comprising rubber pads on an aluminium base, are designed for use on all types of stairs to eliminate wear.

SEALING COMPOUNDS

A booklet describing the various "Bostik" adhesive and sealing compounds used in the building industry, with illustrations of work which has been done, has been produced by the B. B. Chemical Co., Ltd., Ulverscroft-road, Leicester.

HEATING CALCULATIONS FOLDERS

Two new dimensions folders for their panel and column radiators have been produced by Gulf Radiators, Ltd., 229, Regent-street, W1. They are designed to assist the architect, heating engineer or builder with heating plans and to give all the information necessary for rapid calculations.

SPECIFICATION HANDBOOK

To provide a guide to the techniques and practical aspects of building maintenance, a specification handbook has been produced by Tretol, Ltd. It is divided into self-contained detachable sections, each dealing with a specific subject. From time to time, as fresh products and techniques are developed, further specification sheets will be issued to supplement the book's contents. Copies, free, from the company at Tretol House, The Hyde, NW9.

DUCTED WARM AIR HEATING

The system of central heating by ducted warm air produced by Radiation, Ltd., 7, Stratford-place, W1, has been installed in an extension to Abbotts (Phit-Eezi) shoe store at 324, Oxford-street, London. This system was first used in shoe stores by Messrs. Abbotts and their architects, Vigers and Co., and this particular unit is operated by gas (others being available for oil and solid fuel). Thermostatic control provides a uniform temperature with a variation of not more than one degree F. at any point. The shopfitters for the scheme were E. Pollard and Co., the decor being by Mr. A. J. Milne, MSIA.

BLOCKS FROM WASTE MATERIALS

A concrete building block suitable for permanent building construction is being produced from pulverised fuel ash by Refcon Structures, Ltd., Tavistock House South, Tavistock-square, WC1. Assembly is a simple operation requiring neither mortar bedding nor bonding, as the blocks are interlocking, their cavities being filled with an appropriate infilling to meet requirements. Plasterboard can be nailed to the blocks, which are understood to be applicable as loadbearing walling of all types.

LEATHERBOARD FINISH

The ¼-in. tempered "Presdwood" marketed by Masonite, Ltd., Bevis Marks House, Bevis Marks, EC3, can now be obtained in a leatherboard finish in a choice of five colours, brown, off-white, light blue, light green and buff.

EMULSION PAINTS BOOKLET

A booklet entitled "Polimul in Emulsion Paints," on the use of emulsions of polyvinyl acetate in the manufacture of emulsion paints has been produced by Dunlop Special Products, Ltd., St. James's House, St. James's-street, SW1.

NEW PUBLICATION

The first issue of "The Boydell Bulletin" has now been published by E. Boydell and Co., Ltd., Old Trafford, Manchester 16. It contains an account of the major Ekeberg project being carried out at Oslo, Norway, as well as articles on the various applications to which Muir-Hill equipment can be placed. Subsequent issues of this digest will be produced at periodic intervals.

LIFE ASSURANCE AND PRODUCTION

The annual meeting of the United Kingdom Temperance and General Provident Institution was held at the Chartered Insurance Institute, London, on March 30. In moving the adoption of the report and accounts for 1954, the chairman, Sir John Benn, Bt., stated that the boom conditions enjoyed by this country at home might perhaps threaten our position overseas. There was little likelihood of lower pay being voluntarily accepted, nor any need for this, provided that steps were taken to increase production. Every life assurance contract was a spur and a pledge to greater individual effort on the part of the assured over a period of years.

REINFORCED CONCRETE CONSTRUCTION

The new terylene yarn processing building for Imperial Chemical Industries, Ltd., at Wilton, Middlesbrough, is of reinforced concrete construction, with an area of more than 230,000 sq. ft., and is now nearing completion. Prestressed and shell concrete roofing has been used, particularly in the main production hall where 120 ft. spans of uninterrupted floor space have been made possible. The designing engineers are the British Reinforced Concrete Engineering Co., Ltd., of Stafford, who are also supplying fabric, square twisted bars and prestressing wire. This company has also designed a 5m. gallons reservoir at Goldthorn Hill, with an area of 41,000 sq. ft. The floor and walls are of reinforced concrete, and reinforced concrete "mushroom" columns will support the flat slab roof.

OVERSEAS BUILDING

[From Our Own Correspondents]

Cuba.—Publication has been made recently of the East Havana project which is now being considered by the Cuban Government before going out to contract. This project calls for the construction of a tunnel in Havana Bay and it has been stated that the work is a matter of urgency. . . . The Government have granted a loan for a new glycerine factory and another for a pulp and paper mill.

India.—Licences have been granted to five firms in India to establish ferro-manganese factories. They are as follows: The Mysore Iron and Steel Works, Bhadravati who will build at Mysore; the Jeypore Mining Syndicate, Madras, who will build at Orissa; Messrs. Rambahadur Thakur and Co., Samastipur, Bihar, who will build at Singhbhumi; Messrs. Cambata Industries, Bombay, who will build at Tumsar in Madhya Pradesh; Messrs. Electro Metallurgical Works, Ltd., Bombay, who will build at Dandeli, Bombay.

Malaya.—The army has started long-term permanent building schemes in the Federation of Malaya which in total will cost more than £3m. The largest project is at Sungei Besi, near Kuala Lumpur, where a brigade headquarters building, housing 3,000 men in a complete miniature township, will cost £2m. At Kluang, in Johore, a base camp for a battalion of the Malay Regiment and at Malacca the headquarters of the First Battalion of the Federation Regiment will be built. These schemes will cost over £½m. each and are to be completed by the end of 1956.

General improvements recommended by a consultant in his report on the Panang Port will cost about £1,800,000. The improvements call for the reclamation of Weld Quay, expansion and modernisation of services, expansion of Bagan Dalam Slipway and workshops. . . . The Singapore Housing Authorities intend to spend £1½m. on the immediate construction of 3,767 low cost houses. A programme for a further 4,900 dwellings at a cost of £2m. is now being drawn up.

According to the Senior Inspector of Schools, 18 primary and four secondary English schools are to be built at a cost of £800,000. . . . The Geological Survey has begun preliminary work on clearing and levelling the site for its new Federal headquarters in Ipoh to be built at an estimated cost of £½m. . . . It has been decided that the site for Malaya's proposed £½m. fisheries research institute originally planned for Penang will now be in Malacca. On the new site about 90 acres will have to be cleared before building can start. Buildings will include a laboratory, offices, library, museum, store, workshop and dark room.

A Singapore Harbour Board port extension scheme to develop East Lagoon at an estimated cost of £4m, is expected to begin towards the end of this year. . . . It is reported that the Federal capital is embarking on an active building programme involving at least £2m. Up to the end of 1954 a total of 976 plans for new buildings were received by the Municipal Architect. . . . A new fire station is to be built in Kuala Lumpur at an estimated cost of £10,000.

The contract for the construction of the new Queen's Dock was obtained by a Singapore firm of civil engineering contractors, Gammon (Malaya), Ltd., in competition with several British firms who submitted tenders. . . . The Singapore Improvements Trust has approved the revised plans of the Shell Company's £400,000 15-storey building in Collyer Quay. . . . The contract for the £½m. construction of Kallang bridge has been awarded to the Paul Y Construction Co. of Singapore. The successful tender was a little under £600,000.

The Singapore City Council also has plans for a new £20,000 bridge in Geylang Serai. Plans for the bridge are now being drawn up. . . . It is hoped that work on Singapore's £½m. Urban Health Centre for medical and health training will commence soon. Plans have already been prepared. . . . The Department of Social Welfare in Singapore plans to erect a £40,000 building to serve as a community centre, crêche and girls' hostel.

New Zealand.—A modern 6-storey science block at Victoria University College, New Zealand, is the first to be put in hand of four major buildings. The other university building projects are engineering blocks at Auckland and Canterbury, and a dental block at Dunedin.

These will be dealt with in an order of priority agreed upon by the government and the university grants committee.

New Zealand.—The new Zealand Ministry of Works is to spend about £70m. on public works this year. Included in that figure is £20m. for hydro-electric power. Mr. C. W. O. Turner, engineer-in-chief of the Ministry stated during a trip to the USA that his Ministry expects to have a 40,000kW generating plant ready in three years time which will use natural steam from subterranean volcanic activity.

Nyasaland.—A hydro-electric power project to be established on the Shire River, Nyasaland, costing more than £77m. is recommended in a report tabled in the

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CORRECTION

Messrs. Bradstreet's British Ltd. wish it to be known that as a result of some confusion in their offices they had issued supplementary reports to certain of their subscribers to the effect that A. & J. Simmons Ltd., Building Contractors, of Woking, Surrey, had decided upon Members' Voluntary Winding-up. Messrs. Bradstreets, following discovery of the error took the earliest possible steps to correct the same, such incorrect information is, so they are informed, in circulation within the Building, Allied and other Trades in Southern England. Accordingly, Messrs. Bradstreets publish this announcement in order to correct any misapprehension on the subject.

Federal Parliament recently. The report mentions the possibility of navigation from Lake Nyasa downstream to a land and water terminus within 36 miles of Blantyre. The report has been prepared, after three years' research, by Sir William Halcrow and Partners. It recommends that a barrage should be built on the Shire River in order to stabilise the level of Lake Nyasa, provide hydro-electric power for the eastern portion of the Federation, and make possible the irrigation of large areas of the lower Shire River Valley. The report states that the scheme could be carried out by stages.

The capital cost of the first phase is estimated at £23,631,000. This will include the installation of a hydro-electrical power station to produce a peak load of 30,000kw. The ultimate capacity of the scheme, for which a choice of five suitable sites is available, is set by the consultants at more than 100,000kw. A number of new factories will also be planned to encourage suitable industries such as production of fertilisers, cotton goods from local crops, aluminium, paper manufacturing from reeds, jute, sugar industries, and cement production. It is also expected that the Portuguese Government, whose territory adjoins the scheme, will participate in the work.

OVERSEAS TRADE FAIRS

* An increasing number of British firms are taking part in trade fairs overseas and there is an even greater increase in the number of such opportunities becoming available. In an attempt to point out the pitfalls, to advise British firms on how to make the most of exhibiting overseas, and to set out the merits of some of the most notable trade fairs abroad, the Board of Trade has published a booklet for intending exhibitors.

Drawing on the experience of several British manufacturers who have successfully shown their goods abroad, it deals with such subjects as the choice of fair, methods of exhibiting, costs, publicity and public relations.

Among the sample budgets printed (they include fares and everything but entertainment expenses) are those for small-scale participation at the Canadian International Trade Fair, 1954, for £650 inclusive, and for a more elaborate display at the Milan Samples Fair, 1954, costing over £3,000. The booklet is called "Trade Fairs Overseas," price 1s. from the Stationery Office.

BUILDING MATERIALS

* Lindsley Steel Company, 3810 NW 17th Avenue, Miami 42, Florida, USA, are interested in receiving quotations from United Kingdom manufacturers of steel and steel products; wire nails; screws; bolts; door butts; tee hinges; strap hinges; door locks; fibre wallboard; hardboard; insulation board; tiles; asphalt; rubber and vinyl plastic floor tile; gypsum board; gypsum lath; plastic laminates in rolls; flush doors; galvanized metal lath for plaster.

Manufacturers interested in this inquiry should write by air mail direct to Mr. Milton Klika of the Lindsley Steel Company with full details of their offers and quotations in US dollars cif Tampa, Florida, or Miami, Florida. Telephone inquiries to Chancery 4411, ext. 776, quoting ref: ESB/5562/55.

* From the Board of Trade Special Register Information Service.

The SCOTTISH BUILDER

Power Station to Cost £46m.

THE Earl of Home, Minister of State for Scotland, announced in Edinburgh, on April 1, that the new electricity generating station to be built at Kincardine-on-Forth will cost £46m. It will be the largest power station in Scotland, producing more than four times the total consumption in the city of Glasgow. Its ultimate capacity of 720 megawatts is equivalent to about a million horse-power.

The Secretary of State has given planning permission for the station, which will be built immediately to the west of Kincardine on the north bank of the River Forth. The site will be laid out to accommodate not only the generating station but also 275,000-volt and 132,000-volt transforming and switching stations. It will be constructed in two sections each containing three 120,000 kilowatt turbo-alternators, the first section being designed for completion in 1960.

About two million tons of coal will be used each year, and the coal store to be erected at the station will have a capacity of 450,000 tons. When in full commission, the efficiency of the station will enable 700,000 tons of coal to be saved each year, compared with present generating conditions.

Housing in February

THE NUMBER of new houses completed in Scotland in February was 2,468; in the same month last year the figure was 2,665. These figures are given in the Monthly Housing Return issued by the Department of Health for Scotland and the Ministry of Housing and Local Government, and published on April 1 by HM Stationery Office, price 2d.

By February 28, completions for this year totalled 4,887. In the first two months of last year the total was 5,618. Altogether 267,777 new homes (235,601 permanent and 32,176 temporary) have now been built in Scotland under the post-war housing programme.

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SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from February 7, 1955. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen, 3s. 9½d.; Labourers, 3s. 4d.

For apprentices, the rates are:

Year.	Percentage of Craftsman's rate.	For week of 44 hours. s.	d.
1st	25	41	8½
2nd	33⅓	55	7½
3rd	50	83	5
4th	66⅔	111	2½
5th	75	125	1½

For female labour, the rates are:

	s.	d.
Operatives on craft operations (at end of probationary period)	3	4
Operatives on labouring operations (at end of probationary period)	3	0½

Dumbiedykes Housing

MR. A. STEELE, Edinburgh City Architect, has told the Corporation housing committee that it will take at least a year to prepare working drawings for the Dumbiedykes redevelopment scheme, approval of which by the Secretary of State was announced on March 28.

The form of construction, he said, might be either steel or reinforced concrete, and they would have a lot of research to put in on that.

The committee agreed to appoint Messrs. Kinnear and Gordon, chartered civil engineers, Edinburgh, as consulting engineers for the scheme, which involves the clearance and rebuilding of the area bounded by the Pleasance, Holyrood, Carnegie-street and the Queen's Park. It will provide close on 800 houses.

Restoring Old Edinburgh

"THERE IS no building in the Royal Mile owned by Edinburgh Corporation which is not receiving attention at the present time," said Lord Provost John G. Banks on March 31, when he moved the adoption of the annual report at the 47th annual meeting of the Old Edinburgh Club in the City Chambers.

In a review of what had already been achieved, and what might be hoped for in the future, Mr. Banks said there were several other properties in which the Corporation had an interest. He could not say anything more publicly, but the members of the club could be assured that no chance would be missed in the Town Council's endeavour to make the Royal Mile a living part of the city.

NEW BUILDINGS

Aberdeen.—Corporation has plans in hand for the second development of the Summerfield housing district (993 houses), and also for scheme of three-storey flats with 24 houses at the Ashgrove housing site. Architect, Alexander B. Gardner (F), Architectural Offices, Broad-st., The Castlegate, Aberdeen.

Alloa.—Clackmannan CC have approved plans for the construction of a new academy at Alloa, work on which should begin in April. The cost is estimated at £190,000 and construction is expected to continue over a period of three years.

Ayr.—Plans have been approved for fire station at the Convent House site, Craigie-rd. Corporation A, Thomas O'Brien (A), Municipal-bldgs., High-st., The Sandgate, Ayr.

Edinburgh.—The following projects have received the sanction of the Dean of Guild Court: a £45,000 structure at Juniper-green for the Woodhall Paper Co., Ltd., for machine house and boiler room, and a £49,275 building for United Wire Co., Ltd., at West Granton-rd., Granton.

Falkirk.—Stirlingshire CC has plans in hand for Catholic prim. sch. at St. Francis. Architect, Alexander J. Smith (F), County Offices, Old Infirmary-bldgs., Spittall-st., Stirling.

Fort Augustus.—Inverness-shire CC has had plans prepared for scheme of 45 houses. Architect, Alexander Cullen, County Architectural Offices, Inverness Castle, Castlehill, Inverness.

Glasgow.—Plans have been prepared for the BBC for extensions and additions at Glasgow City Broadcasting House.

Glasgow.—Plans have been prepared for the Glasgow West End Clothing Co., Ltd., for additions and alterations at Argyll-st. and Hope-st. Architect, Baron Bercott (A), 118, Blythswood-st., Glasgow.

Glasgow.—Plans prepared by their own architects have been approved for extensions at Pinkstone-rd., Keppochhill, for William Forbes & Co., Ltd., 1, Blythswood-sq., Glasgow.

Glasgow.—Plans have been approved for scheme of reconstruction and additions at Kensington-gate. Architect, A. D. Hislop (Campbell & Hislop, FF.RIBA), United Kingdom Provident Institution-bldgs., St. Vincent-st., Glasgow.

Glasgow.—Plans have been approved for library and a factor's office at Beels-ave. Architect, Archibald G. Jury (F), Planning and Architectural Department, Glasgow Cross, The Trongate, Glasgow.

Glasgow.—Plans have been approved for Boots Cash Chemists (Northern), Ltd., for additions and alterations at 101 to 105, Sauchiehall-st. Architect's Dept., Boots Pure Drug Co., Ltd., Station-rd., Nottingham.

Glasgow.—Plans have been approved for scheme of demolition of present buildings and erection of new warehouse buildings for F. W. Woolworth & Co., Ltd., at New City-rd. and Stephen-st. Architect, Mr. H. Winbourne (F), Martins Bank-bldgs., Water-st., Liverpool.

Greenock.—Plans prepared by their engineers and architects have been approved for new extensions and power plant buildings at Drumfrocher-rd., Upper Greenock, for the Westburn Sugar Refiners, Ltd., Lyndoch-st., Greenock.

Greenock.—Plans prepared by their architects have been approved for additions and alterations at West Blackhall-st. by the Greenock Central Co-op. Soc., Ltd., Co-operative-bldgs., Roxburgh-st., Greenock.

Greenock.—Plans have been approved for offices, etc., at Leven-rd., Greenock East. Architect, John Bolton (A), Swan's-bldgs., Vennel & Hamilton-st. Junction, Greenock.

Greenock.—Plans have been prepared for commercial garage, with workshops and other offices, and two houses for J. Thomson & Sons, Finnart Garage, at Catherine-st. Architect, John Stevenson Thomson, Robertson-st., Greenock West.

Kirkealdy.—Fifeshire CC has had plans approved for extensions, alterations and additions to the Templehall jun. sec. sch. County A, Robert S. Lawrie (A), County-bldgs., St. Catherine-st., Cupar, Fife.

Lanarkshire.—Plans have been approved for Scottish Industrial Estates, Ltd., Woodside-pl., Glasgow, for new extensions at the Newhouse Industrial estate. Architects, Mitchell, Johnstone & Co., 160, West George-st., Glasgow.

Lanarkshire.—Plans prepared for Aitkens, Robertson & Whiteford, Ltd., have been approved for their new factory at the Thornliebank estate. Architects, Watson, Salmond & Gray (F&A), Central Station-bldgs., Union-st., Glasgow.

Orkney.—Plans are being prepared for municipal buildings. requisite offices and council chambers at Tankerness House, Broad-st., Kirkwall. Architects, G. Lindsay & Ptnrs. (F&F), 17, Great Stuart-st., Westend, Edinburgh.

NEW COMPANIES

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

R. Emerson & Sons (South Shields), Ltd. (544422.) Regd. February 10, 1955. Horsley Hill-rd., South Shields. Carpenters, joiners, bldrs., etc. Nom. cap.: £1,000. Dir.: A. Emerson.

Formcrete, Ltd. (544438.) Regd. February 10, 1955. Bldrs. and constructors of concrete works and prefabricated bldgs., etc. Nom. cap.: £1,000. Dir.: R. W. H. Gaze, Hillside Farm, East Horsley, Surrey.

Balls and Partners, Ltd. (545049.) Regd. February 25, 1955, Tresillian, The Ridgway, Cuffley, Herts. Civil engrs. and public works contractors, etc. Nom. cap.: £1,000. Dir.: V. A. Balls.

C. L. Moule, Ltd. (545004.) Regd. February 25, 1955, 870, Walsall-rd., Gt. Barr, Birmingham, 22a. Constructional engrs., public works contractors, etc. Nom. cap.: £2,000. Dir.: C. L. Moule (permt.).

Castle Estates (Ongar), Ltd. (544970.) Regd. February 24, 1955, High-st., Ongar, Essex. Bldrs. and contractors, etc. Nom. cap.: £1,000. Dir.: O. J. Dean.

T. J. Walker and Co., Ltd. (544985.) Regd. February 24, 1955, 54, Sandy-leaze, Westbury-on-Trym, Bristol. Bldrs. and contractors, etc. Nom. cap.: £1,000. Dir.: T. J. Walker.

Page and Ryan, Ltd. (544952.) Regd. February 24, 1955, 10, Parliament-st., Gloucester. Bldrs., demolition and bldg. contractors, etc. Nom. cap.: £2,000. Dir.: D. J. Page.

A. Colgate, Ltd. (544929.) Regd. February 24, 1955, 141, Staines-rd., Hounslow, Middx. Bldrs., etc. Nom. cap.: £1,000. Dir.: A. Colgate.

John Marsh and Son (Plant), Ltd. (544864.) Regd. February 22, 1955, Pier-chbrs., Medway-st., Chatham, Kent. To mnfr., sell and hire bldrs.' plant, including scaffolds, concrete mixers, etc. Nom. cap.: £500. Dir.: J. T. Marsh.

Rushton Contractors (Doncaster), Ltd. (544836.) Regd. February 21, 1955, Dorchie, Wong-la., Tickhill, nr. Doncaster. Bldrs., etc. Nom. cap.: £100. Dir.: A. Chapman.

A. T. Lowe and Sons, Ltd. (544839.) Regd. February 21, 1955. Slaters and tilers, bldrs., etc. Nom. cap.: £2,000. Dirs.: Not named. Sub.: A. T. Lowe, 10, Jarvis-ave., Oakdale-rd., Nottingham.

Lewis Taylor and Wilson, Ltd. (544764.) Regd. February 19, 1955, 152b, Church-st., Preston, Lancs. Bldrs. and contractors, etc. Nom. cap.: £750. Dir.: J. S. Taylor.

Matthew Charlton and Sons (Slaters), Ltd. (544771.) Regd. February 19, 1955, Station-rd., Hexham. Slaters. Nom. cap.: £10,000. Permt. dir.: R. B. Charlton.

Small and Partners, Ltd. (544780.) Regd. February 19, 1955, 54, Station-rd., New Barnet, Herts. Heating and ventilating and fire protection experts and advisers, etc. Nom. cap.: £200. Dir.: K. A. Small.

W. A. Manning, Ltd. (544783.) Regd. February 19, 1955, 88, High-st., Hoddesdon, Herts. Bldrs., etc. Nom. cap.: £500. Dir.: W. A. Manning.

W. E. Parsons and Co., Ltd. (545045.) Regd. February 25, 1955, Lime-st. Brickworks, Ellesmere Port. Ches. Public works contractor, bldr. and plant hirer. Nom. cap.: £5,000. Dir.: W. E. Parsons.

G. H. Spavin, Ltd. (544754.) Regd. February 19, 1955, rear 47, Lindley-st., Ashby, Scunthorpe. Bldr. and contractor. Nom. cap.: £3,000. Dir.: G. H. Spavin.

Ambrose & Beaver (Leyland), Ltd. (545437.) Regd. March 5, 1955. Dorothy-ave., Hough-la., Leyland, bldrs., etc. Nom. cap.: £3,000. Permt. dir.: T. Ambrose.

R. Barwood & Sons, Ltd. (545760.) Regd. March 11, 1955. 85, Sanderstead-rd., South Croydon, bldrs., house decorators, etc. Nom. cap.: £10,000. Dir.: L. Barwood.

Stirling Rogers, Ltd. (545765.) Regd. March 11, 1955. 112, Gresham House, Old Broad-st., EC2, bldrs., public works contractors, etc. Nom. cap.: £5,000. Dir.: W. S. Rogers.

F. J. Mee, Ltd. (545739.) Regd. March 11, 1955. 2, Loughborough Park, SW9, bldr. and contractor. Nom. cap.: £1,000. Permt. dir.: F. J. Mee.

G. Patterson, Ltd. (545742.) Regd. March 11, 1955. 42, High-st., Sutton, Surrey, bldrs. and contractors, etc. Nom. cap.: £2,000. Dir.: G. Patterson.

G. S. Goodwin (Contractors), Ltd. (545743.) Regd. March 11, 1955. 84, Borough-rd., Middlesbrough, genl. and public works contractors, bldrs., etc. Nom. cap.: £100. Dir.: G. S. Goodison.

Hamton Development Co., Ltd. (545713.) Regd. March 10, 1955. 2, West Borough, Wimborne, Dorset, bldrs., etc. Nom. cap.: £100. Dir.: A. A. Keniston.

Hoyle and Bowdrey, Ltd. (545585.) Regd. March 9, 1955. 198, Desborough-rd., High Wycombe, Bucks, bldrs., contractors, etc. Nom. cap.: £100. Dir.: G. Hoyle.

Structural Building Products, Ltd. (545570.) Regd. March 8, 1955. 11, Lincolns Inn Fields, WC2, mnfrs. of and dlrs. in cement, concrete, bricks, tiles, stone, slate, timber, etc. Nom. cap.: £20,000. Dir.: W. S. A. Atkins.

Clifford & Gough, Ltd. (545576.) Regd. March 9, 1955. 96, Estcourt-rd., Watford, Herts, bldrs. and contractors, etc. Nom. cap.: £5,000. Dir.: Gertrude E. Gough.

Wood and Harrison (St. Annes), Ltd. (545562.) Regd. March 8, 1955. 100, Curzon-rd., St. Annes, Lytham St. Annes, bldrs. Nom. cap.: £2,000. Dir.: J. Wood.

Runway Construction Co., Ltd. (545551.) Regd. March 8, 1955, 27a, Broad-st., Wokingham, Berks, bldrs. and contractors, Government and public works contractors, engrs., etc. Nom. cap.: £5,000. Dir.: A. Whaley.

John A. Barnett (Ardwick), Ltd. (545541.) Regd. March 8, 1955. 224, Hyde-rd., Ardwick, Manchester, bldrs. and contractors, etc. Nom. cap.: £2,000. Dir.: J. A. Barnett.

International Combustion Group Purchasing, Ltd. (545505.) Regd. March 7, 1955. 19, Woburn-place, WC1, dlrs. in engineering materials, plant, machinery, etc. Nom. cap.: £100. Dir.: J. P. Gilliver.

Fell Construction Co. (Lancashire), Ltd. (545501.) Regd. March 7, 1955. 20-30, Lawefield-la., Wakefield, Yorks, contractors, bldrs. etc. Nom. cap.: £5,000. Dir.: R. Fell.

H. B. Webb, Ltd. (545448.) Regd. March 8, 1955. 6, Cleveland-rd., Paignton, Devon, bldrs. and contractors, etc. Nom. cap.: £1,000. Dir.: H. B. Webb.

J. Taylor (Ashford), Ltd. (545456.) Regd. March 5, 1955. 32, Ferndale-rd., Ashford, Middx, bldrs. and contractors, etc. Nom. cap.: £3,000. Dir.: F. R. Taylor.

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Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

APRIL 12.

***†Winchester City C.**—10 dwellings, Wolvesey-terr. A. S. Wilson & Ptnrs., chartered quantity surveyors, 8, Storey's-gate, SW1. Dep. £2 2s.

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APRIL 14.

***Bristol City C.**—Three blocks of flats and maisonettes, Aberdeen-rd. City A.

***†Glasgow Corpn.**—Shops and flats, Cadder-rd. Architectural and Planning Dept., 20, Trongate, C1.

***†Surrey CC.**—New clinic, Cobham. County A, Kingston-on-Thames.

***†Swansea CBC.**—Depot for Central Works dept. Cave-st. Boro' A. Dep. £5.

APRIL 15.

***†East Sussex CC.**—Additions, Herstmonceux C of E School. County A, Lewes.

***†Wandsworth BC.**—26 flats and 2 houses. TC.

APRIL 16.

***†Essex CC.**—Branch library, St. Nicholas-ave., Elm Park, Hornchurch. County A, Chelmsford.

APRIL 18.

***†East Sussex CC.**—Additions, Lewes County Grammar School for Boys. County A, Lewes.

***†Swansea CBC.**—232 dwellings, Bonymaen estate. Boro' A.

APRIL 20.

***†Blackburn CBC.**—Residential home, Shadsworth estate. BE. Dep. £2 2s.

APRIL 21.

***Glasgow Corpn.**—Shops and flats, Castlemilk site. Architectural and Planning Dept., 20, Trongate, C1.

APRIL 22.

***†East Suffolk CC.**—Workshop block, Lowestoft College of Further Education. County A, Ipswich. Tenders by April 29.

***†Wanstead and Woodford BC.**—Nine flats, Cross-rd., Woodford Bridge. Tooley & Foster, architects, Midland Bank-chbrs., Buckhurst Hill, Essex.

***†Wanstead and Woodford BC.**—18 flats, 10 houses and 6 garages, Vicarage-rd., Woodford Bridge. Tooley & Foster, architects, Midland Bank-chbrs., Buckhurst Hill, Essex.

APRIL 23.

***†Basildon UDC.**—63 houses, Pound-la. site, Laindon. E&S. Dep. £2 2s.

APRIL 25.

***Chichester City C.**—21 stalls Butter market. City E&S, "Greyfriars," North-st. Dep. £5 5s.

***Ealing BC.**—Dressing-rooms, Horsenden Hill playing fields. BE&S. Dep. £2.

***Sittingbourne and Milton UDC.**—86 dwellings, North Court housing estate. E&S. Dep. £3 3s.

APRIL 26.

Erith BC.—52 houses at Elmhurst/Bedonwell-rd BE&S. Dep. £2 2s.

APRIL 28.

***†Coventry Corpn.**—Nursery school, Barley Lee Stoke Aldermoor. City A, Bull-yard. Dep. £2 2s. Tenders by June 1.

APRIL 29.

***Walthamstow BC.**—(a) 6 flats, Clifford-rd./Forest-rd. and (b) 10 flats Bisterne-ave./Fyfield-rd. Boro' A, E&S. Dep. £2 2s. each.

MAY 2.

***Cuckfield RDC.**—Five conveniences. E&S. Dep. £2 2s.

***Cuckfield RDC.**—Sports pavilion and public convenience, Balcombe. E&S. Dep. £2 2s.

MAY 3.

***Hatfield RDC.**—91 houses and 21 garages on Redhall Farm site. J. H. Parker, ARIBA, 82, Great North-rd. Dep. £5 5s.

MAY 9.

***West Riding CC.**—Additions Batley Healey County primary school. County A, Bishopgarth, Westfield-rd., Wakefield. Dep. £2 2s.

MAY 16.

***Cuckfield RDC.**—12 dwellings, Copthorne. E&S. Dep. £2 2s.

NO DATE.

***Peterborough Jt. Ed. Bd.**—Extensions to County Grammar School for Girls, Lincoln-rd. Ruddle and Wilkinson (F&L), architects, Long Causeway-chbrs. Dep. £2 2s.

***Rhyl.**—About 250 properties, with roads and sewers, within three years' period. J. Hampson & Co., 14, Sussex-st., Rhyl.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

APRIL 11.

***†Durham CC.**—Repairs, etc., to three schools. County A, Court-la., Durham.

APRIL 15.

***Middlesbrough CBC.**—External stonework repairs and steam cleaning. BE.

APRIL 28.

***Southend-on-Sea CBC.**—Chain link fencing, Hamstel School playing fields, Hamstel-rd. Boro' A, 30, Alexandra-st.

APRIL 30.

***Southend-on-Sea CBC.**—Removal of classroom galleries, Chalkwell junior school. Boro' A, 30, Alexandra-st.

MAY 9.

***Carlisle City C.**—Engineering services, Harraby secondary modern school. City S., 18, Fisher-st.

ROADS, SEWERAGE AND WATER WORKS

APRIL 15.

***†East Elloe RDC.**—Site preparatory work, Sutton Bridge. Architect, Council Offices, Holbeach, Spalding, Lincs.

APRIL 22.

†Chanctonbury RDC.—Main drainage of Steyning, Bramber and Beeding (C21/4—Contract XI). Howard Humphreys and Sons, consulting engineers, Victoria Stn. House, Victoria-st., SW1. Dep. £5 5s. Tenders by May 3.

APRIL 25.

Lleyn RDC.—New sewage disposal works at Fourcrosses, contract 11. Howard Humphreys and Sons, engineers, Victoria Station House, Victoria-st., Westminster, SW1. Dep. £5 5s.

Loftus UDC.—258 lin. yds. of 18-in. dia. cast-iron pipe sewer encased in concrete, Skinningrove sea outfall sewer. W. H. Newton, MICE, civil engineer, 197, Scalby-rd., Scarborough. Dep. £3 3s.

APRIL 26.

Bletchley UDC.—Laying of a trunk sewer (contract No. 5). John Taylor and Sons, engineers, Artillery House, Artillery-row, SW1. Dep. £5.

APRIL 27.

East Suffolk CC.—Reconstruction of Benhall railway bridge, nr. Saxmundham. County S. Dep. £5.

Manchester City C.—Roads and sewers as stage 1 of civic centre development, Wythenshawe. City S.

Romsey and Stockbridge RDC.—Broughton pumping station, contract no. 5. Lemon and Blizard, engineers, Lansdowne House, Castle-la., Southampton. Dep. £3 3s.

APRIL 28.

Slenford UDC.—Roads and sewers at Gypsy-la. estate. J. W. Harris, S.

APRIL 30.

Oswestry RDC.—Stage 2, roads and sewer works at West-pl. housing estate, Gobowen. E&S. Dep. £2 2s.

MAY 6.

Frome RDC.—Rode sewerage, 450 lin. yds. of 15-in. concrete pipe sewers and 1,050 lin. yds. of 9-in. stoneware pipe sewers. Sir Arnold Waters, MICE, 25, Temple-row, Birmingham, 2. Dep. £5 5s.

***Rugby BC.**—Paving, etc., Cattle Market. BS. Dep. £2 2s.

MAY 7.

Petworth RDC.—Road and site works at Plaistow housing estate. Godman and Kay, 13, North-par., Horsham.

GENERAL BUILDING WORK (LONDON)

Camberwell—SITE ACQUISITION.—LCC Hsg. Com. recommend that the Riddell-st. areas be acquired, cleared and partially redeveloped at an estimated cost of £60,000.

City.—OFFICE BLOCK.—Plans are being prepared by Ronald Ward and Ptnrs., architects, 29, Chesham-pl., Belgrave-sq., SW1, for the redevelopment of the site of 270, Bishopsgate, EC1, by the erection of a building comprising shop with office accommodation above.

Finsbury—SITE ACQUISITION.—The acquisition, clearance and partial redevelopment for housing purposes, of a site in Mitchell-st. and another in Old-st., providing an area of just over half an acre as an extension to the Wenlake estate, has been recommended by LCC Hsg. Com. The estimated cost of the scheme would be £27,600.

Greenwich—AGED PERSONS' HOME.—LCC Welfare Com. have approved proposals for the adaptation of Drake Court on the Brooklands Park housing estate as a small home for the aged, and the erection of a two-storey extension. The estimated cost of erection and adaptation is £49,810.

Kensington—NEW TOWN HALL.—Finance Com. recommend that E. Vincent Harris, OBE, RA, FRIBA, 19, West Eaton-pl., SW1, be retained to act as architect for the proposed new town hall and central library on the Abbey site in Hornton-st., and that he be instructed to prepare sketch plans and preliminary drawings for the scheme.

Lewisham—TOWN HALL RECONSTRUCTION.—Proposals for the extension and rebuilding of the Town Hall, already approved by MBC, have been received conditional LCC approval for the development.

Old Kent-rd—FIRE STATION.—LCC Fire Brigade Com. have approved proposals for the rebuilding of Old Kent-rd. fire station on a new site. The estimated cost of the scheme would be £23,000, and the Home Secretary has approved the proposals in principle.

Victoria.—MUSEUM REMODELLED.—Plans prepared by Sir Hugh Casson, MA, FRIBA, 110 Old Brompton-rd., SW7, for the remodelling of the Royal Sanitary Institute's Museum of Health at 90, Buckingham Palace-rd., SW1, have been approved by the RSI Council. Proposals include several structural alterations, such as a translucent suspended ceiling, new wall surfaces, wider gallery and a cinema. Work will be put in hand at an early date.

(PROVINCIAL)

Altrincham.—Rebuilding proposed of "Moss Trooper," Mess-la., for Wilsons Brewery Co., Ltd., Manchester. A, R. S. Litherland, 41, South King-st., Manchester.

Barnard Castle.—RDC to build 28 houses at Evenwood to plans by J. Lawton, ARIBA, 45, Galgate.

Billingham-on-Tees.—Newcastle Breweries, Ltd., Haymarket, Newcastle-on-Tyne, plan construction of licensed premises at The Causeway, perhaps in two stages. A, E. M. Lawson, Barras Buildings, Barras Bridge, Newcastle-on-Tyne.—UDC to acquire additional housing land near Marsh House-ave.—MH and LG has offered to consider contract, spread over two years, for erection of 400 "No Fines" houses by Wimpey and Co., Ltd., Orchard House, Newcastle-on-Tyne. UDC considering proposal. UDC S, J. H. Shepherd.

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Boldon.—UDC to place contracts for erection of 90 houses and 12 bungalows at Boldon. Plans by S, J. T. Edmonson, Council Offices.

Bradford.—MoW propose erection of office block at junction Leeds-rd./Gledhill-rd., £33,500 est. Plans by MoW Architects Department, London.

Bridlington.—Marshalls (Bridlington), Ltd., propose further 190 bungalows at Graingers Camp, Wilsthorpe. A, J. Houghton, 147, Fairfax-rd., Hull.

Brierley Hill.—TC to erect 200 houses in 1955.

Carlisle.—Robinson & Murray, Ltd., Builders, Wigton, propose erection of 32 flats at Wigton-rd.

Chadderton.—UDC propose erection of 80 bungalows on Broadway site.

Chesterfield.—RDC to sell site at Heath estate to RC Auth. for erection of Church.

Chester-le-Street.—RDC seek permission to build houses on 15 acres of land at North Lodge. Council A, F. Bowman, Estate Office, Birtley.

Coventry.—TC propose development of housing site at junction Banners-la/Tanners-la.—Approved: layout for 223 dwellings at Tile Hill Neighbourhood Unit South and erection of South Link Block comprising two-tier shopping centre. (Plans by City A.)

Cumberland.—CC included in building programme proposed residential hostel for old people at Maryport. County A, J. H. Haughan, Portland-sq.

Darlington.—G. Dougill and Sons, Ltd., builders, to erect six houses in Yoredale-ave.—Revised plans approved by TC for proposed club premises, Brinkburn-rd., for Darlington Railway Athletic Assoc.

Darlington.—Corp Dev. Com. given plan permission for site for church near Leas; also site for church adjoining St. Habert's Church hall on north side of Farm-rd.

Durham.—Mr. C. Elgey, 7a, North Bailey, Durham, architect for proposed £15,000 observatory at Potters Bank for Durham University.

Easington (Co. Durham).—J. Nimmo and Son, Castle Eden, Co. Durham, to build licensed premises at Crimdon and are preparing own plans.

Ellesmere Port.—West Cheshire Brewery Co., Ltd., propose new licensed premises at Overpool.

Gosforth (Northumberland).—Plans under consideration for erection of new premises for Gosforth and Coxlodge British Legion. A, A. S. Waring, 36, Jesmond-rd., Newcastle-on-Tyne.

Halesowen.—TC to invite tenders for 104 houses at Furnace Park Estate.—Wolverhampton and Dudley Breweries propose new licensed premises on Hasbury Farm Estate.

Hebburn-on-Tyne.—John Rowell & Son, High-st., Gateshead, to build licensed premises in Mill-la. to plans by Page, Son & Hill, 75, King-st., South Shields. Scheme approved by licensing authorities and UDC.—UDC to erect family group home by direct labour on behalf of Durham CC; also approved in principle erection of new stores, weighbridge, garages and workshop at council's dept.—Revised plans by S, R. C. Bestow, approved for shops and flats on Campbell Park No. 2 and Monkton-la. No. 2 estates.

Hexham.—UDC to build 60 houses this year. Plans by S.

Ilkeston.—BC in conjunction with Alfreton, Heanor and Eastwood UDCs and Belper RDC, propose erection of joint crematorium at Codnor Crosshills.

Kidsgrove.—Ind Coope and Allsopp, Ltd., Burton-on-Trent, propose new licensed premises at Galley Bank Estate.

Liverpool.—Yates Castle Brewery Co., Ltd., 76, Hamilton-st., Birkenhead, propose rebuilding of licensed premises at 23, Dean-st.—R. Silcock & Son propose extensions to office building at Old Hall-st. Architects, G. de Coursy Fraser & Geary, 27, Dale-st., Liverpool.—New Parish Church of St. Lukes to be erected at Bold-st. for Liverpool Diocesan Reorganisation Com. A, D. Gordon MacConville, Bewsey Chambers, Bewsey-st., Warrington.

Lytham St. Annes.—BC approved plans, 13 detached bungalows at St. Albans-rd. and Shepherd-rd. for Mr. T. T. Bird.

Manchester.—TC approved plans: block of two factories at Bent-st., Cheetham, for Cheetwood Estates, Ltd. (Plans submitted by A. Castle & Sons, Ltd., 1/11, Teneriffe-st., Salford); 25 detached houses at Partridge-ave., and Blackcarr-rd., Baguley, for Albany Building Co, Ltd. (Architects, Drury and Gomersall, Roxy Cinema, Oxford-st.).—James Moores, Ltd., propose erection factory and offices at Irlam-st. and Goodier-st., Newton Heath. A, Harold F. V. Newsome, 36, Derby-rd., Heaton Moor.—T. Wall & Sons, Ltd., propose erection of ice cream depot at Shentonfield-rd., Northenden. A, W. Broadbent Thompson and Wilson, Hillary Chambers, Hillary-pl., Leeds.

Middlesbrough.—Health Com. approved plans by BE for maternity and child welfare clinic on Park End estate. Clinic will include two dental surgeries and recovery room.

Newcastle-on-Tyne.—Ed. Com. received final approval to further stage of plans for College of Technology, Approved section is seven-storey block for pure science, cost about £368,000. City A, G. Kenyon.

Newport Pagnell.—Permission granted by Min. for erection of garage and petrol filling station fronting proposed new by-pass at Loughton, for E. W. Daniels, Loughton.

North Riding.—Gleeds, 8, St. James's-st., Derby, been appointed QS by EC for proposed £42,000 Colburn Cty. Prim. Sch. Architects, S. Morrison and Ptnrs., Full-st., Derby.

North Riding.—Ed. Com. approved school building programme for 1955-56, cost £1,300,000, and programme for 1957, cost £1m.

Northumberland.—Final plans approved for proposed Wallsend Willington Quay Cty. Inf. Sch., cost £53,000. County A, C. C. Brown, County Hall, Newcastle-on-Tyne.—J. W. Summers and Ptnrs., 33, Jesmond-rd., Newcastle, appointed QS by EC. for proposed Wallsend Cty. Sec. Sch. A. Reavell and Cahill, Lloyds Bank Chambers, Alnwick.

Northwich.—UDC received allocation of 60 houses for 1955.

Oswestry.—RDC approved layout for 44 houses at Gobowen.

Otley.—West Riding CC propose construction of kitchen and dining room at Riversdale-rd. for Otley Sec. Sch. £12,500 est.

Pearith.—UDC approved revised scheme for construction of 100 houses at Milner Mount. Council's A, F. E. B. Blanc.

Peterlee (Co. Durham).—Local British Legion branch approved in principle £40,000 scheme for construction of new club premises.

Rochdale.—Manchester Reg. Hosp. Board to commence work this year on erection of pathological laboratory at Birch Hill Hospital; also ophthalmic unit. New outpatients department on site between Stonehill, Heights-la. and Nurses' Home.

Saltburn (Yorks).—UDC approved in principle £10,700 scheme by S, R. Stroughair, for converting Saltburn Baths Hall into dance hall and conference building.

Seaton Valley.—UDC received loan sanction for £36,809 for erection of 30 houses on Village-rd. Estate, Cramlington. S, T. W. Burgess, Council Offices, Seaton Delaval.

Settle.—RDC propose erection of 10 houses at Ingleton. A, J. N. Spencer, Dean House, Piccadilly, Bradford.

Smethwick.—BC seek Min. approval of final plans for Stage 1 of Sandwell Co. Sec. Sch. £210,500 est.

Southampton.—Mullard Radio Valve Co., Ltd., propose erection of giant factory on Millbrook Trading Estate.

South Shields.—Gibbons, Ltd., Havelock-st., propose factory on 1¼-acres site in Maxwell-st.

Spennymoor.—UDC to build market and bus station behind Town Hall. Plans by S.

Stockport.—TC approved plans for welfare centre at Junction Furnival-st/Gorton-rd., North Reddish.—Erection of 37 houses at St. James-rd. for G. Emery (Builders), Ltd., 56, Mellington-ave., Manchester, 20. New hotel on site of Brinnington Mount, Brinnington Estate. A. G. Bullmore, Lloyds Bank Chambers, Great Underbank.

Stockton-on-Tees.—A. E. Gray and Sons, builders, Thornaby, approached TC regarding site in Grangefield-rd. for erection of office block, flat, workshop, material store, garage, etc.—TC considering reconstruction of Corporation warehouse.—Revised scheme drawn up by BE for new municipal buildings and hall at cost of £225,000.—C. S. Errington, 46, Grainger-st., Newcastle-on-Tyne, prepared revised plans for offices in Church-rd. for Gorrills, Ltd.—Moorhouse and Barker, Ltd., builders, Thornaby, to erect 42 houses at rear of Green Beck, Hartburn, to plans by G. P. Stainsby, 57, High-st., Stockton.—Norman Stonehouse, builder, Northcote-st., Stockton, proposes 81 houses near Darlington-rd. to plans by F. W. Turnbull, White House, Carlton.—Kendrews, Ltd., builders, Roseberry-rd., Norton, to erect 152 houses at Northcote Hill, Roseberry-rd.—T. Croawford, 80, Borough-rd., Middlesbrough, architect for Presbytery at St. Bede's RC Church.

Sunderland.—Steels and Sunderland, Holmside, to extend their Scotia Depot near High-st. Work expected to start about end of April: No contracts let. Architects, Newrick and Blackbell, John-st.

Sunderland.—Corpn. received confirmation of slum clearance order for Lawrence-st. area, where maisonettes and houses will be built. Plans by Boro' A.

Sutton-in-Ashfield.—UDC propose erection of 12 flats and 4 bungalows between Priestic-rd. and Northfield-cl.

Tynemouth.—Cackett, Burns, Dick and McKellar, 21, Ellison-pl., Newcastle-on-Tyne, architects for proposed showroom and garage at Cullercoats for G. Davidson and Son.—British Railways to consider provision of halt station at Tynemouth Long Sands.—Revised plans prepared by BE for 20 houses and 10 flats on West Chirton "B" Estate approved.—TC approved plans by G. H. Gray and Ptnrs., Camden-st., North Shields, for proposed flats at East Howdon, Percy Main and North Shields, for TC.—Vacuum Oil Co., Ltd., propose garage and petrol filling station, workshops and lock-up garages at Rake-la.

Urmston.—UDC approved plans: Reinforced concrete bulding for new factory with office accommodation at Tenax-rd. for Platts (Barton), Ltd.; Extensions to research department and drawing office at Mosley-rd. for Superheater Co., Ltd.

Wallsend.—G. E. Charlewood, 14, Neville-st., Newcastle, architect for new St. John's Church. Scheme still in early stages.

Wardle.—UDC to prepare detailed plans for 30 houses on site bounded by Ashbrook-cres., Hollowspell, and Oakliffe-rd.

Wednesbury.—TC approved scheme for erection of 38 houses at Winchester-rd.

West Hartlepool.—Corpn. Welfare Com. approved scheme by Boro' A., A. G. Sinclair, for construction of two blocks of flatlets for old people, cost £15,900.

Whitehaven.—Plans for extension of Lakeland factory, for West Cumberland Development Co., Ltd., prepared by Ronald Ward & Ptnrs., architects, 29, Chesham-pl., Belgrave-sq., SW1.

TENDERS

* Denotes *accepted*
† Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*
§ Denotes *accepted subject to modification.*
¶ Denotes *accepted by H.M. Government Departments.*

Blaydon (Co. Durham).—Additions to Huntley Well Social Club, Winlaton Mill. Architects, W. Dixon & Son, Collingwood-st., Newcastle-on-Tyne: *Greensitt Brothers, Blaydon.

Brierley Hill.—Second phase of new civic centre comprising council chamber and civic suite for TC: *E. Fletcher (Builders), Ltd., 34, High-st., Kingswinford, £49,068.

British Railways (London Midland Region).—The following contracts have been placed:—

With T. W. Ward, Ltd., Albion Works, Sheffield, for the removal of track, bridges and structures on the Ashby-Worthington line. With the British Challenge Glazing Co., 14-18, High-st., Stratford, E15, for the renewal of roof coverings with patent roof glazing of Birmingham Vauxhall carriage shed. With E. Wood & Sons, Ltd., 70, Park-st., Derby, for the renewal of roof coverings at Birmingham Vauxhall carriage shed. With L. Fairclough, Ltd., Chapel-st., Adlington, Lancs, for the drainage and stabilisation of cutting slopes and formation renewal of the Roade-Rugby line at Milton, between 61 miles 1,575 yards and 62 miles 340 yards. With Soil Mechanics, Ltd., 65a, Old Church-st., SW3, for the construction of substructure for the new intersection bridge to carry the access lines over the main lines to the NCB coke ovens sidings at Clay Cross.

British Railways (Eastern Region).—The undermentioned contracts have been placed:—*William Sindall, Ltd., Gloucester-st., Cambridge, construction of depot office and messroom, messroom and lavatory in sleeper stack store, two latrine blocks, weighbridge office and drainage and sewage disposal plant at new central permanent way depot, Chesterton Junction. *Tersons, Ltd., 4, Dollis-park, N3, construction of roadways, ramps, loading docks, storage areas, drainage and fencing for new central stores depot, Peterborough. *Arundel (Contractors), Ltd., 70, Harris-st., Bradford, cleaning and painting of station buildings, goods yards and sheds, signals, signal boxes, point rodding and linework, etc., between Tapton Junction and Woodhouse Mill. *The Butterley Co., Ltd., Engineering Works, Butterley, Nr. Derby, reconstruction of portion of superstructure of Underline Bridge No. 84 between Clay Cross and Chesterfield (Midland).

Chapel-En-Le-Frith.—Houses for RDC: 28 at Swallowhouse-la., Hayfield. *Cosgrove and Partners, Manchester, £40,265: 8 at Brierley Park, Buxworth, *F. Williamson (Contractors), Ltd., Stockport, £13,369.

Cramlington (Northumberland).—Additions to club premises at Cramlington Village. Architects, W. Dixon & Son, 1, Collingwood-st., Newcastle-on-Tyne: *Shevill & Son, Hawthorn-st., Benwell, Newcastle-on-Tyne.

Cudworth.—Fifty "Townson" houses at Darfield-rd. Estate, for UDC.: *William Townson & Sons, Ltd., Higher Swan-la., Bolton.

Darlington.—Adaptations and alterations to the head post office: *F. Shepard & Son, Leeds.

Dunbartonshire.—Favtory for W. Fearnhough & Co., Ltd., 102, Bath-st., Glasgow, at South-st., Scotstoun. Architects, John Keppie & Henderson & Gleave, 196, West Regent-st., Glasgow: *Findlay & Macgecchan, Ltd., 1097, Tollcross-rd., Parkhead, Glasgow.

Felling (Co. Durham).—Canteen in Stoneygate-la., for the International Paint Co.: *J. R. Rutherford & Sons, Jesmond, Newcastle-on-Tyne.

Gosforth (Northumberland).—Erection of houses on 50 acres of land near Fawdon-la. by private enterprise: *William Leech, Ltd., 2, Claydon-st., Newcastle-on-Tyne.

Grantham.—34 houses, for BC E&S, T. J. Livesey L. AMICE. Quantities by K. H. Bole, FRICS, 20, Lowndes-st., London: †W. Dobie & Sons, Ltd., "Cortina," Chignal-rd., Chelmsford, £47,580.

Halesowen.—52 houses at the Hasbury Farm Estate for TC: *Claude Burkes & Son, Ltd., £67,747; 20 at the Fatherless Barn Estate: *A. H. Farmer & Son (Builders), Ltd., £26,707.

Halifax.—St. Thomas More's Secondary Modern RC School for RC Authorities: *Pickles Bros. (Builders), Ltd., Gibbet-st., Halifax.

Lanarkshire.—Plans have been approved for factory for Macfarlane, Lang & Co., Ltd., at Clydeford-dr., Maukinfauld-rd., Tollcross. Architects, James Monro & Son (F&A), 25, Woodside-pl., Charing Cross, Glasgow. QS, A. L. Currie & Brown, 11, Woodside-pl: *R. & W. Anderston (Builders), Ltd., 31, Woodside-terr., Charing Cross, Glasgow, £90,000.

Lancs.—Kirkby St. Laurence RC School for EC: *Unit Construction Co., Ltd., Speke Boulevard, Liverpool, £120,044; phase 1 of Huyton with Roby St. Aidens RC School: *Tysons (Contractors), Ltd., Dryden-st., Liverpool, £39,437.

Leicester.—40 bungalows and 24 cottage flats at New Parks Estate for TC: *C. W. & A. L. Hughes, Ltd., 102, Bargrave-st., Leicester, £60,550.

LCC.—Construction of a four-storey block of eight maisonettes and four tenants' stores at Wilberforce estate (Hibbert-st. area), Battersea:—

W. Walkerdine, Ltd., Kensington ..	£21,497
Kerridge (Cambridge), Ltd., Cambridge ..	21,212
Frank Batty & Smith, Ltd., Paddington ..	20,970
Hunter & Clark (Southern), Ltd., Battersea	20,846
H. T. Oliver & Sons, Ltd., Lambeth ..	20,672
G. Ward (Ealing), Ltd., Ealing ..	20,286
T. Ringham & Co., Ltd., Wimbledon ..	20,100
*William Blood, Ltd., Lambeth	19,475

The architect's comparable estimate is £19,582.

¶London (Air Ministry).—Contracts to the value of £500 or over for the two weeks ended March 26:—

Building work: Y. J. Lovell & Son, Ltd., Marshamla., Gerrards Cross, Bucks; John Laing & Son, Ltd., Dalston-rd., Carlisle; Markwell Holmes & Hayter, Ltd., 198, Albert-ave., Hull; M. A. Boswell (Contractors), Ltd., School-st., Wolverhampton; R. G. Carter, Ltd., Drayton, Norwich; Charles R. Price, Barnsley-rd., Doncaster; Henry Ashton & Son, Newport Joiners Works, Barton-on-Humber; E. Bowman & Sons, Cherryholt-rd., Stamford, Lincs; H. Edmund & Sons, Ltd., 1, Churchfield-st., Dudley, Worcs; William Sindall, Ltd., Gloucester-st., Cambridge; J. M. Jones & Sons, Builders, Ltd., Highway Works, Bath-rd., Maidenhead, Berks; F. Shepherd & Son, Ltd., Blue Bridge-la., York; James Miller & Sons, 15, London-rd., Carlisle, Cumberland; A. J. Dunning & Sons (Weyhill), Ltd., Weyhill, Hants; William Eaves & Co., Ltd., Daggers Hall Works, Vicarage-la., Blackpool; George Wimpey & Co., Ltd., Hammersmith-gr., W6; W. J. Simms, Sons & Cooke, Ltd., Haydn-rd., Sherwood, Nottingham; Samuel Orr & Sons, Ltd., Clooney-terr., Londonderry; John Carnegie & Son, Ltd., 35, Seafield-rd., Dundee, Angus. *Heating services:* Edward Deane & Beal, Ltd., Temple-chbrs., Temple-ave., EC4; G. N. Hayden & Sons, Ltd., 19-29, Woburn-pl., WC1; J. Jeffreys & Co., Ltd., St. George's House, 195-203, Waterloo-rd., SE1.

Artificer's work and maintenance of land: G. & J. Seddon, Ltd., Coronation-bldg., Little Hulton, nr. Manchester; Thomas Collins & Co., Ltd., St. Werburghs, Bristol, 2; W. L. Bell, Woolavington, Bridgwater, Somerset; J. V. Strong & Co., Ltd., Manor Farm House, Stanton, St. Bernards, nr. Marlborough; G. O. & W. L. Watts (Grazeley) Conts., Ltd., Chalcot Works, Bath-rd., Calcot, nr. Reading, Berks; Brown Fraser & Co., Ltd., Lochbridge, North Berwick, East Lothian; Moorhouse & Barker, Ltd., Thornaby-rd., Thornaby-on-Tees; J. T. Tarran & Son, Ltd., Enterpen, Hutton, Rudby, Yarm, Yorks; R. G. Carter, Ltd., Drayton, Norwich; Wm. Cornforth (Whitby), Ltd., 9, Baxter-gate, Whitby, Yorks; Sandy & Co., 2, North Walls, Stafford. *Resurfacing work:* Amey's Asphalt Co., Ltd., Sutton Courtney, Abingdon, Berks.

London (Metropolitan Police).—Internal cleaning and redecoration, Hampton Police Station and D. garage, Middlesex Paint Craftsmen, £1,275. Erection of eight flats, 79, Ladbroke-rd., W11, Allard & Saunders, Ltd., £19,681.

¶London (War Dept.).—Contracts placed by War Department for week ended March 26:—

Berkshire: Building work, A. J. Wait & Co., Ltd., New Malden. *Gloucestershire:* Building work, T. F. Howells, Ltd., Caerphilly. *Hampshire:* Roofing repairs, Maurice Hill, Ltd., Horndean. *Invernessshire:* Building work, Alex Mackenzie & Son, Kirkhill. *Kent:* Road work, W. H. Bensted & Son (Contractors), Ltd., Maidstone; painting and decorating, C. & T. Painters, Ltd., London; building work, H. Goodsell, Maidstone; road work, Johnson Bros. (Aylesford), Ltd., Tonbridge. *Lancashire:* Painting, Allen McDermott, Bradford. *Leicestershire:* Road work, Bradshaw Bros. (Contractors), Ltd., Leicester. *Norfolk:* Building work, Tooley & Youngs, Stalham. *Staffordshire:* Building work, W. Simkin, Ltd., Burton-on-Trent. *Surrey:* Building work, Henry T. Hill & Son, Ltd., Brookwood; heating and hot water installation, The "Ray-Heeting" Co., Ltd., Leatherhead; electrical installation, F. H. Wheeler &

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Co., Ltd., London. *Sussex:* Building work, F. W. Honour & Sons, Ltd., East Grinstead. *Yorkshire:* Chain link fencing, Boulton & Paul, Ltd., Norwich.

Manchester.—Twin operating theatre suite at Crumpsall Hospital, Delaunays-rd., Crumpsall, for Regional Hospital Board: *Wm. Gornall & Sons, Ltd., Ellesmere-st., Bolton, £68,300; large extensions to biscuit factory at Leestones-rd., Northenden, for W. J. Brookes & Co., Ltd.; *Wm. Thorpe & Son, Ltd., Chester-rd., Manchester.

Middlesbrough.—Park End County Primary School, for EC. Education A, K. J. Caton, Education Offices: *Arthur Robinson (Contractors), Ltd., Linthorpe-rd., Middlesbrough, £91,215.

Newcastle-on-Tyne.—Factory, Blandford-st., for the Newcastle Knitwear Co. Architect, Henry Gatoff, 51, Grainger-st., Newcastle: *Thomas Hutchinson & Co., Elswick-rd., Newcastle.

Newcastle-on-Tyne.—Alterations to premises for Fenwick, Ltd., Northumberland-st. Architects, W. Dixon & Son, 1, Collingwood-st., Newcastle: *Stanley Miller, Ltd., 17, North-st., Newcastle-on-Tyne.

Newcastle-under-Lyme.—New premises at the Bradwell Estate for Swettenhams, Ltd.: *Elsby Bros., Ltd., Sneyd Hill, Burslem, Stoke-on-Trent.

North Riding.—Cleveland ESN School, for the EC. School A, D. W. Dickenson, County Hall, Northallerton: *A. Robinson (Contractors), Ltd., Linthorpe-rd., Middlesbrough, £39,979.

Ramsbottom.—44 houses and 24 flats at Tagg Wood Estate for UDC: *J. E. France, Ltd., Orleans Works, Peel-st., Manchester, £92,412.

Redcar.—Cleveland Technical College, for North Riding of Yorkshire EC. School A, D. W. Dickenson, County Hall, Northallerton. QS, Davies, Belfield & Everest, 9, Ashley-pl., SW1. Mechanical and electrical consultants, Stinton, Jones & Ptnrs., 21, Gloucester-pl., W1: *F. Shepherd & Sons, Ltd., Blue Bridge-la., York, £120,250.

Rothwell (Yorks).—30 houses at Wood-la. housing site, for UDC. Architect, R. A. Easdale & Son, F/ARICS, L/ARIBA. Quantities by R. A. Easdale & Son:—

F. & C. Leach	£40,792
Fred Clough, West Ardsley	40,504
John Scott & Son, Ossett	40,467
N. B. Bell & Co., Ltd.	40,123
Middleton & Co. (Blackpool), Ltd.	39,483
*Messrs. Harlow & Milner, Ltd., Warren-yard, Warrengate, Wakefield	39,185

Rowley Regis.—Factory at Hainge-rd., Tividale, for Biddle & Edwards, Ltd.: *W. Whittingham, Ltd., Ettingshall-rd., Wolverhampton.

South Shields.—Additional classrooms at Mortimer-rd. County Infants' School, for the EC Architects, Page Son & Hill, 75, King-st., South Shields. QS, R. S. Malloch, 6, Eldon-sq., Newcastle-on-Tyne: *Carruthers & Son, Heugh-terr., South Shields, £8,625.

Sunderland.—Alterations to the telephone exchange, St. Thomas-st., Sunderland: *K. Matthews & Co., 25, Villiers-st., Sunderland.

Wallsend.—Erection of three-storey flats on the Low Willington Estate, for the TC: Boro' E, G. N. Teasdale: *J. H. James & Sons, Archer-st., Willington Quay, £57,442.

Whitby.—Priory Chapel for St. Hilda's School. Architect, C. D. Taylor, 41, Baxtergate, Whitby: *Mollekin Brothers, Ltd., West Parade-rd., Scarborough.

Whitley Bay.—68 houses on the Earsdon Grange Estate: *G. Wimpey & Co., Ltd., Orchard House, Newcastle-on-Tyne.

Wimbledon.—Construction of roads and sewers and erection of walls and fences at Queensmere-rd. estate for BC: †John Sugrue & Sons, Ltd., London, NW6, £35,509.

Wolverhampton.—Wobaston Secondary School for EC: *McKeand Smith & Co., Ltd., Showell-rd., Bushbury, Wolverhampton, £162,670.

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